SONY

3-758-840-21(2)

Digital Audio Tape Deck

Operating Instructions

DAT
Digital Audio Tape

SBM
Super Bit Mapping

DTC-60ES

WARNING

Operating Instructions

Before operating the unit, please read this manual thoroughly and retain it for future reference.

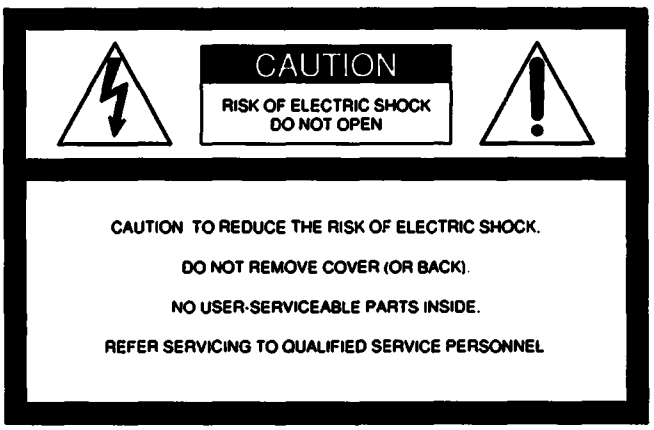
Owner's Record

The model and serial numbers are located on the rear of the unit. Record the serial number in the space provided below. Refer to them whenever you call upon your Sony dealer regarding this product.

Model No. DTC-60ES Serial No._____

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION TO REDUCE THE RISK OF ELECTRIC SHOCK.
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

The graphical symbol are on the rear enclosure.

INFORMATION

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures

— Reorient or relocate the receiving antenna
— Increase the separation between the equipment and receiver.
— Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
— Consult the dealer or an experienced radio/TV technician for help.

CAUTION

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment

For the customers in Canada

CAUTION

TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS POLARIZED AC PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

INFORMATION

This apparatus complies with the Class B limits for radio noise emissions set out in Radio Interference Regulations

IN NO EVENT SHALL SELLER BE LIABLE FOR ANY DIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE, OR LOSSES OR EXPENSES RESULTING FROM ANY DEFECTIVE PRODUCT OR THE USE OF ANY PRODUCT.

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Digital Audio Tape

DAT (Digital Audio Tape) is a new recording system which digitalizes the audio signal and records it on a DAT cassette tape.

DAT records the audio signal by converting the analog sound into a digital signal. This converting system is called the PCM (Pulse Code Modulation), and its accurate processing of the audio signal allows recording/playback with lower wow and flutter, wider dynamic range, lower distortion rate, and superb signal-to-noise ratio.

In addition, various control codes called sub codes can be written on the DAT cassette separately from the audio signal. They are written for a variety of convenient playback/tape editing operations, and except for the absolute time, can be rewritten after audio signal recording has been completed.

Precautions

Safety
- Operate the unit only on 120 V AC, 60 Hz.
- One blade of the plug is wider than the other for the purpose of safety and will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, contact your dealer.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time. To disconnect the cord, pull it out by grasping the plug. Never pull the cord itself.

Operation
Before making program source connections, be sure to unplug the unit.

Installation
Do not install the unit in a location near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.

Moisture Condensation
If the unit is brought directly from a cold to a warm location, moisture may condense inside the unit. In this condition, the tape may adhere to the head drum and be damaged, or the unit may not operate correctly. Always remove the cassette when the unit will not be used.

If moisture is present...
- Function controls will not operate.
- All operations will stop.

When the CAUTION indicator lights and the unit will not operate
Leave the unit turned on for about an hour.

Detaching the side panels (on the model sold in Canda)
After removing the screws, secure the cabinet with the supplied lock screws (M4 × 6). Do not use the longer screws.
For safety, before doing this, be sure to disconnect the AC power cord from the AC outlet.

NOTE
When closing the cassette compartment, do not push the cassette lid forcibly by hand, but perform with the ▲OPEN/CLOSE button.

For the customers in the U.S.A.
For detailed safety precautions, see the "IMPORTANT SAFEGUARDS" leaflet.

If you have any question or problem concerning your unit, please consult your nearest Sony dealer

Features

Serial copy management system
This unit utilizes the serial copy management system that permits digital-to-digital recording for one generation. You can record CD sound or other digital formats through a digital-to-digital connection. (See page 42.)

Date Function automatically memorizes the recording date and time
The year, month, day, day of the week, hour, minute and second are automatically memorized in the subcode area during recording, so that during playback you can display this data to check when the tape was recorded. This function is especially convenient when recording live performances, etc.

Three sampling frequencies
Recording/playback can be done with three sampling frequencies (48 kHz, 44.1 kHz and 32 kHz).
48 kHz: For analog and digital input signals in a standard mode.
44.1 kHz: For compact disc, pre-recorded DAT tape and analog input signals.
32 kHz: For analog input signals in a long-play mode.

Long play mode
This unit can operate in long-play mode. Analog input signals can be recorded or played back for up to four consecutive hours when the DT-120 DAT cassette tape is used. The sampling frequency will be 32 kHz in the long-play mode.

Visible cassette loading
You can view the tape operation through the lid of the cassette compartment. Due to a revolutionary new transport mechanism, cassette loading time has been significantly reduced.

Excellent sound quality
1-bit A/D converter
For the A/D converter section which converts analog input signals to digital signals, the unit employs a 1-bit A/D converter which theoretically generates no zero-cross distortion for a clear, elegant sound quality.
Pulse D/A converter
Superior playback performance is achieved with a 1-bit D/A converter.

SBM (Super Bit Mapping)
Super Bit Mapping reduces noise at the frequency levels most discernible to the human ear, and re-integrates sound information subtracted during the A/D conversion process, greatly improving the dynamic audible range and sound quality of the recorded signal during analog recording.

44.1-kHz analog recording capability
By supporting the recording of analog sources at a sampling frequency of 44.1 kHz, the DTC-60ES allows you to record from DAT tape to a MiniDisc recorder through a digital-to-digital connection.

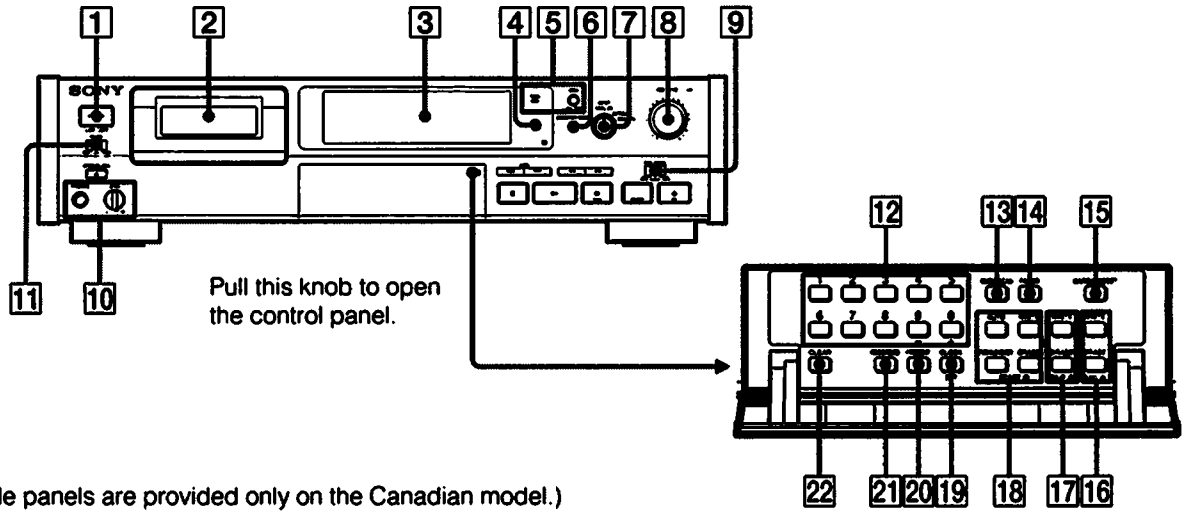
Rich variety of subcode information
This unit can record subcode information such as Start IDs, program numbers, Skip IDs, and absolute time data, enabling you to quickly locate tunes and display the playback time in the same manner as when playing compact discs.

Digital fade-in/fade-out
Professional sounding fade-in/fade-out of either digital or analog signals can be accomplished by use of the FADER button.

Post edit recording of sub codes
You can record or rewrite the following sub codes after the audio signal recording has been completed.
Start ID: Signifies the beginning of a selection.
Program number: Gives a number to the selection.
Skip ID: Signifies the beginning of a portion to be skipped.
End ID: Signifies the end position of recording/playback.
Since sub codes are written on the tape separately from audio signals, the audio signals are not affected.

Location and Function of Controls

Front Panel/Remote Commander



(Side panels are provided only on the Canadian model.)

1 POWER switch
Turns the power on and off.

2 Cassette compartment
Insert a cassette with the window side up and the safety tab facing you.

3 Display window

4 Remote sensor
Receives the signal from the remote commander.

5 SBM (Super Bit Mapping) switch and indicator
Set to ON for Super Bit Mapping during analog recording through the LINE IN jacks in STANDARD recording mode (REC MODE selector).
SBM indicator lights when the SBM function is on (applicable during analog recording only).

6 COUNTER MODE button
Selects the display of the absolute time, elapsed time of the current selection, remaining time to the end of whole tape or linear counter (tape running time). Each time you press the button, the display changes sequentially.

7 INPUT selector
Set according to the signal to be recorded.
ANALOG: For recording from the equipment connected to the LINE IN jacks.
OPTICAL: For recording from the equipment connected to the DIGITAL IN (OPTICAL) jack.
COAXIAL: For recording from the equipment connected to the DIGITAL IN (COAXIAL) jack.

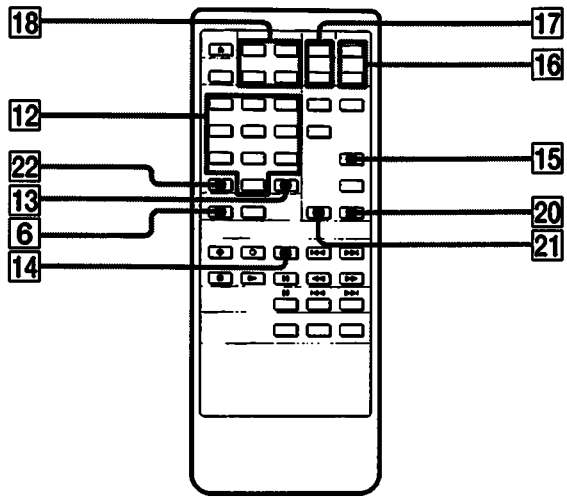
8 REC LEVEL (recording level) controls
Adjust the recording levels and balance for the analog input signals.
The outer knob controls the L (left) channel level and the inner knob the R (right) channel level. The knobs can be adjusted together. To adjust each channel independently, turn the knob while holding the other knob.
When recording digital signals, it is not necessary to adjust the recording levels.

9 REC MODE selector
Normally set to the STANDARD position
When this selector is set to the LONG position, you can record analog input signals or digital signals with 32 kHz in the long-play mode.

10 PHONES-LEVEL jack and control
Insert the headphones plug to this jack and turn the control to adjust the headphones volume level

11 TIMER switch
Normally set to the OFF position When recording or playing back at the desired time using a commercially available audio timer, set to the REC position or the PLAY position respectively.

12 Numeric buttons (0 - 9)
Designate the desired program number to be played back before starting playback Designate the desired number in the record-pause mode, the program number is written consecutively from the designated number.



13 MUSIC SCAN button
Press to listen to the beginning of each selection successively.

14 FADER button
Press to fade in or fade out during recording or playback.

15 MARGIN RESET button
Press to reset the margin of peak level.

16 END ID buttons
WRITE: Press to write the ID signifying the end of playback or recording.
ERASE: Press to erase the end ID.

17 SKIP ID buttons
WRITE: Press at the beginning of the portion you may wish to skip later. A skip ID will be written from the point where you pressed this button.
ERASE: Press to erase the nearest skip ID which is before the current position.

18 START ID buttons
AUTO: Press to turn on and off the AUTO indicator. When the AUTO indicator is lit, the start ID will automatically be written during recording. When the AUTO indicator is not lit, press the START ID WRITE button at the point where you want to write a start ID.
WRITE: Press to write the start ID at the desired point during recording or playback.
ERASE: Press to erase a start ID. When a start ID and a program number are written on the tape, both codes are simultaneously erased by pressing this button.
RENUMBER: Press to renumber all programs on the tape. When only the start IDs are written, pressing this button will insert the proper program numbers beginning with "1". The tape will rewind and start from the beginning to accomplish this function.

19 CLOCK SET button
Press to adjust the time of the clock built in this unit. In this mode, the 0 button and the 9 button function as the + and – buttons respectively.

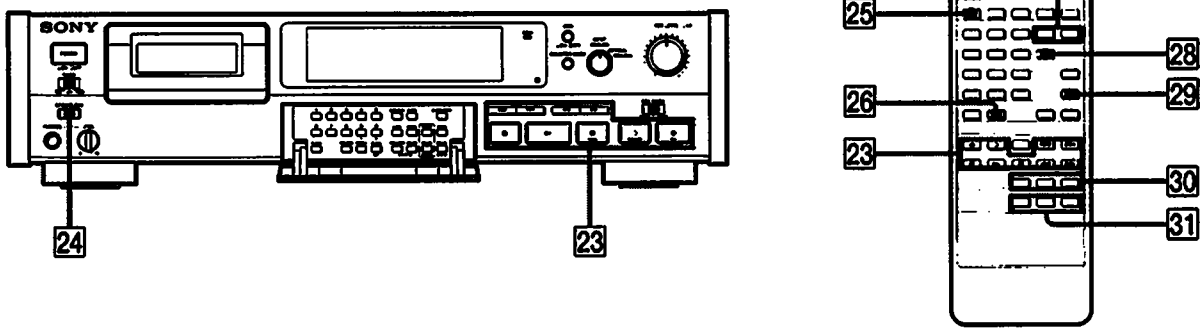
20 PRESENT button
Press to display the current time.
Each time the RECORDED or PRESENT button is pressed, day, month and year display, the day of the week display or hour, minute and second display is switched sequencially.

21 RECORDED button
Press to display the recording day of the tape being played.

22 CLEAR button
Press to cancel the program number which has been mistakenly entered.

Location and Function of Controls

Front Panel/Remote Commander



23 Tape operating buttons

■ (stop): Press to stop recording or playback.

► (play): Press to play back the tape.

II PAUSE (pause): Press to stop for a moment during recording or playback. To restart recording or playback, press this button again or press the ► button.

If the unit is left in the pause mode for about 10 minutes, it will automatically be released and the deck will enter the stop mode. To restart recording or playback from the stop mode, press the ● REC or ► button respectively.

O REC MUTE (record muting): Inserts a sound-muted portion (space).

● REC (recording): Press to enter the record-pause mode. After pressing this button, press the II PAUSE or ► button.

I◄◄ / ►►I (AMS): Press to locate the beginning of the selection during the playback.

◄◄ / ►► (rewind/review, fast-forward/cue): In the stop mode, press to rewind/fast-forward the tape. During playback, press to rewind or fast-forward the tape while listening to the sound.

24 ≙ OPEN/CLOSE button

Press to open or close the cassette compartment.

25 DISPLAY MODE button

Changes the display mode. (Refer to page 10.)

26 RESET

Resets the linear counter to "0M 00s".

27 RMS play buttons

ENTER: To program the selections in a desired order, press this button after pressing the numeric buttons.

CHECK: Press to check the programmed contents

28 REPEAT 1/ALL button

Press to play a desired portion repeatedly. Each time you press the button, the indicatior changes as follows REPEAT 1 → REPEAT ALL → off

29 SKIP PLAY button

Press to activate the skip ID code function. The portion of the tape previously marked will be skipped

30 CD operation buttons

Operative only for the Sony CD player equipped with a Remote Commander.

II (pause): Press this button twice to start playback. Press this button once in the playback mode, the deck enters the pause mode.

I◄◄ / ►►I (AMS): Press to locate the desired selection on the Compact Disc during playback or in the stop mode.

31 CD SYNCHRO (CD synchronized recording) buttons

(The playback of the Sony CD player equipped with a Remote Commander and the recording of the DAT deck can be performed simultaneously.)

STANDBY: Press to set the unit in the record-standby mode.

START: Press to start recording of the DAT deck and then playback of the CD player.

STOP: Press to stop the DAT deck recording and the CD player playback.

Remote Commander Operation

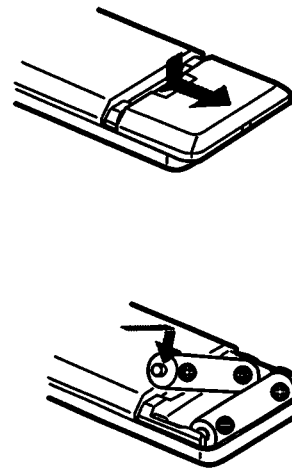
Each button on the remote commander functions in the same way as those having the same name on the front panel.
However, the following operations cannot be performed using the remote commander. Use the front panel controls instead.

- Turning the power on and off
- Selecting digital(optical/coaxial)/analog input source
- Setting the clock
- Adjusting the recording level and balance
- Adjusting the headphones level
- Setting the timer recording/playback
- Selecting the record mode (standard or long)
- Turning the SBM function on and off

The following operations can be performed only with the remote commander.

- Activating CD synchronized recording using a Sony CD player and controlling the CD player
- Locating a selection on the Compact Disc or changing the CD player to pause mode (possible only when a Sony CD player is used)
- Repeat play
- Skip play
- RMS* play
  * RMS: Random Music Sensor
- Resetting the linear counter to "0M 00s"

Installing Batteries



Insert two size AA (R6) batteries with correct polarity, and close the lid.

Notes on remote control

- Do not expose the remote sensor on the deck to strong light such as direct sunlight, lighting apparatus, etc.
- Do not place any obstructions between the Remote Commander and the remote sensor, or else operations will not be performed correctly.
- The controllable range is limited. Point the Remote Commander directly at the remote sensor on the deck.
- When remote control operation distance becomes shorter, the batteries are weak. Replace both batteries with new ones.

To avoid battery leakage

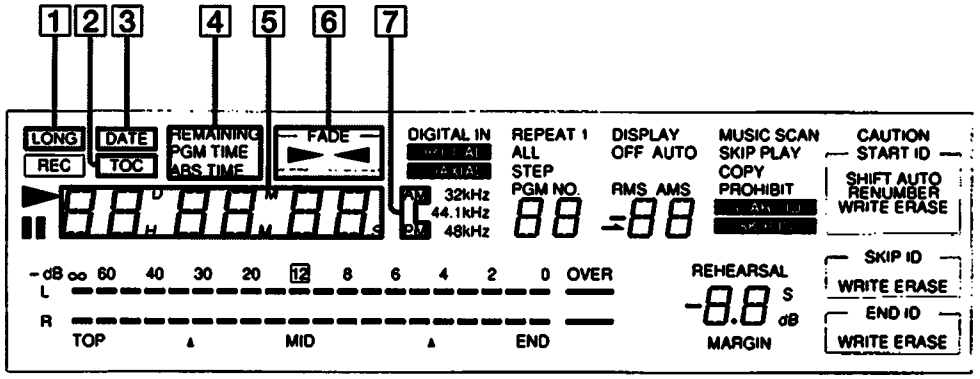
When the commander will not be used for a long period of time, remove the batteries to avoid damage caused by battery leakage and corrosion.

Battery life

About half a year of normal operation can be expected when using the Sony SUM-3 (NS) batteries.

Location and Function of Controls

Display Window



To turn off the display window
When the power is turned on, the display window also is turned on. During recording or playback, all display or some parts of the display can be turned off as follows:
When operating with the front panel controls
While pressing the COUNTER MODE button, press the 0 button.
When operating with the remote commander
Press the DISPLAY MODE button.
Each time you press the above buttons, the indicators change as follows:

Normal indicators ←
↓
Peak level meters and margin indicators go off.
(The DISPLAY OFF indicator lights.)
↓
All the indicators go off during recording or playback*.
(The DISPLAY OFF AUTO indicator lights momentarily just before the indicators go off.)

* When pressing the COUNTER MODE or DISPLAY MODE button except during recording or playback, the DISPLAY OFF AUTO indicator lights. In this case, all the indicators go off immediately after recording or playback starts.

To change the brightness of the display window
While pressing the COUNTER MODE button on the front panel or the COUNTER MODE button on the remote commander, press one of the numeric buttons 1, 2 and 3. The greater number pressed, the darker the display window becomes.

1 LONG play mode indicator
Lights when recording or playback is being performed in the long play mode

2 TOC (Table Of Contents) indicator
When a pre-recorded DAT cassette is played back, this indicator will light

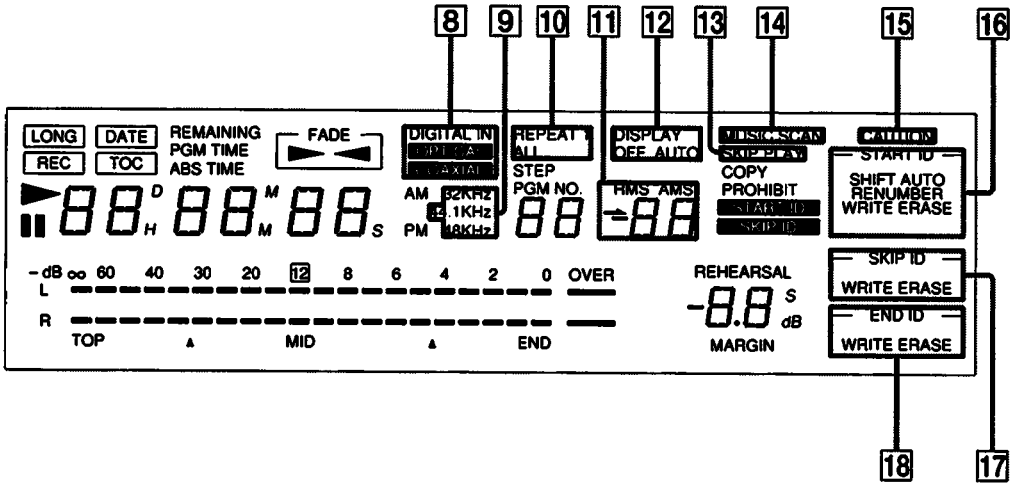
3 DATE indicator
Lights when the RECORDED button is pressed to display the recording day of the tape being played
Flashes when the PRESENT button is pressed to display the current time

4 REMAINING (remaining time): Lights when the counter shows the remaining time of the tape
PGM TIME (program time): Lights when the counter shows the elapsed time of the current selection
ABS TIME (absolute time) indicator: Lights when the counter shows the elapsed time from the beginning of the tape.

5 Time indicator
Indicates the tape running time, absolute time, elapsed time of the current selection, remaining time or recording day. Each time the COUNTER MODE button is pressed, the display is changed

6 Fade in/out indicator
FADE : Flashes when recording or playback fades in
FADE : Flashes when recording of playback fades out

7 AM/PM indicators
Show AM or PM of the time



8 INPUT selector indicators
The DIGITAL IN OPTICAL or COAXIAL indicator lights according to the position of the INPUT selector. No indicator lights when the INPUT selector is set to the ANALOG position.

9 SAMPLING FREQ. (Sampling frequency) indicator
48kHz: For recording/playback of analog input signals (standard mode).
44.1kHz: For recording/playback of CD, a pre-recorded DAT cassette or analog input signals.
32kHz: For recording/playback of analog input signals (long-play mode).

10 REPEAT indicators
REPEAT 1: Lights when a desired selection is played back repeatedly.
REPEAT ALL: Lights when all the selections are played back repeatedly.

11 AMS (Automatic Music Sensor)/RMS (Random Music Sensor) indicators
Show the number of selections to be skipped ahead or behind in the AMS operation. When designating a selection directly by the numeric button and the ► button, the display shows the program number of the target selection while the selection is being searched for. When programming the desired selections in the RMS operation (page 39), the display shows the program number of the selection to be programmed.

12 DISPLAY OFF/AUTO indicators
The DISPLAY OFF indicator lights when peak level meters and margin indicators are turned off. The DISPLAY OFF AUTO indicator lights momentarily before all the indicators are turned off.

13 SKIP PLAY indicator
When this indicator is lit during playback, the portion marked by the skip ID is skipped and playback continues from the next start ID.

14 MUSIC SCAN indicator
Lights after the MUSIC SCAN button is pressed to listen to the beginning of each selection successively.

15 CAUTION indicator
Lights when moisture condensation occurs. If this happens, the deck stops functioning automatically. (See page 4.)

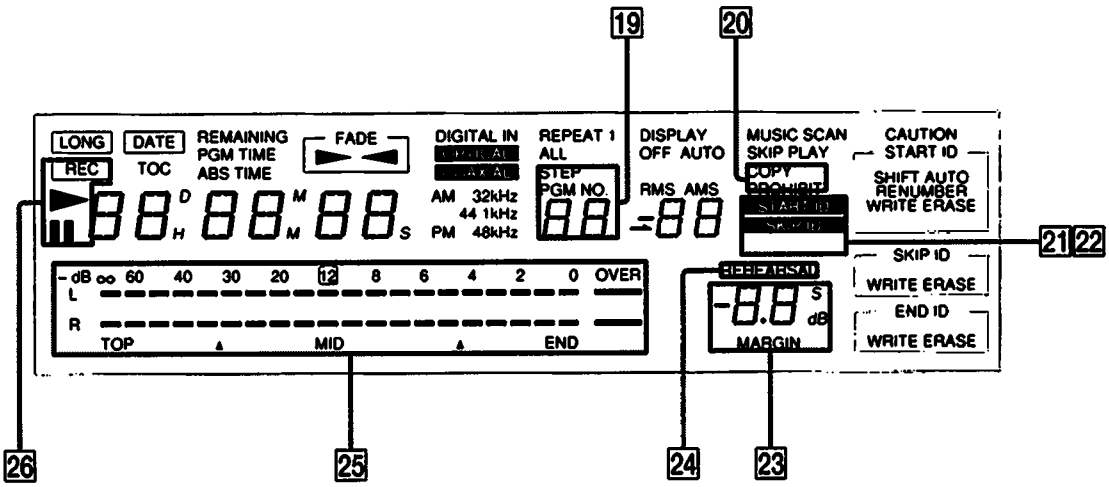
16 START ID mode indicators
AUTO: Lights when the AUTO button is pressed to write the start ID automatically.
RENUMBER: Lights when the RENUMBER button is pressed to renumber the program numbers.
WRITE: Lights when writing the start ID manually.
ERASE: Lights when erasing the start ID.
AUTO RENUMBER: Lights when renumbering program numbers automatically.
SHIFT RENUMBER: Lights when shifting the start ID and program number position.

17 SKIP ID mode indicator
WRITE: Lights when writing the skip ID.
ERASE: Lights when erasing the skip ID.

18 END ID mode indicator
WRITE: Lights when writing the end ID.
ERASE: Lights when erasing the end ID.

Location and Function of Controls

Display Window



19 STEP/PGM NO. indicator
Shows the program number of the selection being played. When programming the desired selection with the RMS operation (page 39), the display shows the step number of the programmed selection.

20 COPY PROHIBIT indicator
Lights when recording the digital signal with the copy prohibit code. In this case, record with the LINE IN jacks.

21 START ID indicator
Flashes when writing (for 9 or 18 seconds) or erasing a start ID code, and lights when the start ID is detected during playback.

22 SKIP ID indicator
Lights when writing (for 1 or 2 seconds) or erasing a skip ID code or when the skip ID is detected during playback.

23 MARGIN indicator
Shows how much margin there is between the peak level of input audio signal and 0 dB.

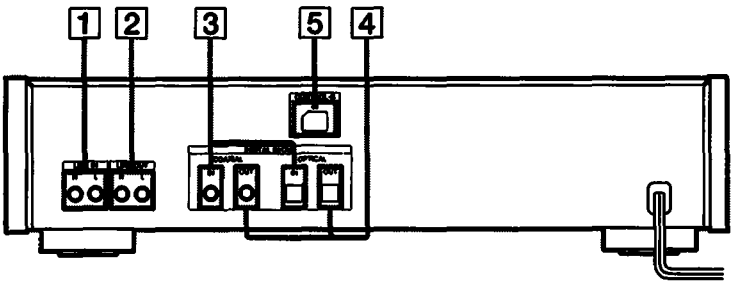
24 REHEARSAL indicator
Lights while the rehearsal function is activated (page 29).

25 Peak level meters/Frequencies map
Indicate the signal levels during playback and recording. There are separate meters for each left and right channel. These meters have a peak hold function which indicates the peak level momentarily
When pressing the 4 button while keeping the COUNTER MODE button pressed, the sampling frequencies with which the tape was recorded is displayed (page 35).

26 Tape operation indicators
REC : Lights during recording or in the record-pause mode.
► : Lights during recording or playback. It also lights in the record-pause mode or in the play-pause mode.
❚❚ : Lights in the record-pause mode or in the play-pause mode.

Connections

Rear Panel Jacks



1 LINE IN (line input) jacks (phono jack)
Connect to the recording outputs of an amplifier. Signals supplied by the amplifier can be recorded using the sampling frequency of 48 kHz or 44.1 kHz in the standard play mode or 32 kHz in the long play mode.

2 LINE OUT (line output) jacks (phono jack)
Connect to the DAT or tape inputs of an amplifier. The playback signal of this deck will be output.

3 COAXIAL/OPTICAL DIGITAL IN (digital input) jacks (coaxial phono jack/optical jack)
Connect to the digital outputs of an amplifier with a digital output jack or another digital source such as a CD player for digital-to-digital recording.

4 COAXIAL/OPTICAL DIGITAL OUT (digital output) jack (coaxial phono jack/optical jack)
Connect to the digital inputs of an amplifier having a built-in D/A converter or another DAT deck, for playback of a DAT cassette or digital-to-digital recording.

5 CONTROL-S IN jack
Connect to the CONTROL-S output of a Sony amplifier or receiver for remote control.

Notes on connection
- Use the connecting cords specified in the illustrations.
- Turn off the power for all equipments before making connections.
- Be sure to insert the plugs firmly into the jacks. Loose connections may cause hum and noise. When unplugging, grasp the plug and not the cord.

Notes on the optical cable
- Do not bend the cord. When the cord is not used, curl it with a diameter of more than 15 cm (5 $^{7}/_{8}$ inches).
- Do not use it under high temperatures.
- When the optical cable is not connected, cover the OPTICAL IN/OUT jacks with the supplied caps.

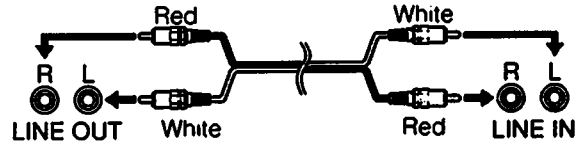
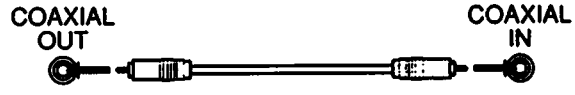
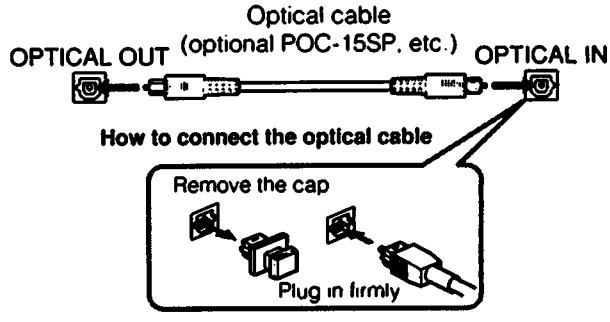
Note on sound signals
When connecting an optical cable to the DIGITAL IN/ DIGITAL OUT jacks, sound signals (L/R) are transmitted together through the cable.

Note on the CONTROL-S IN jack
To remote control this unit through a receiver or amplifier, connect the input of this unit to the CONTROL-S output of a Sony receiver or amplifier, with a CONTROL-S cable. When this connection is used, only remote control commands sent through the receiver or amplifier will be executed. The remote sensor of this unit will not function.

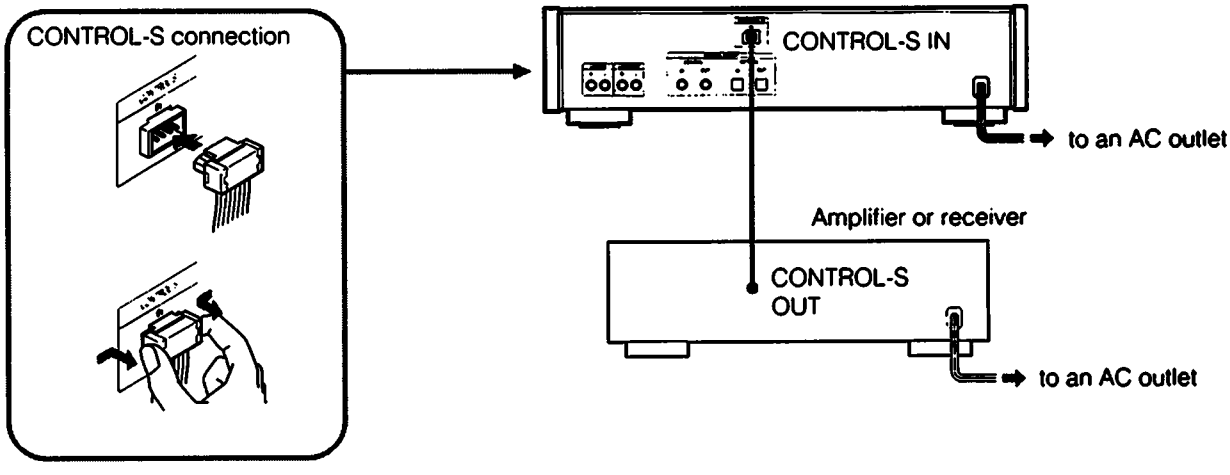
Connections

Connecting Cords

There are following three types of connecting jacks at the rear of the deck. Each type of jack requires a different type of connecting cord.

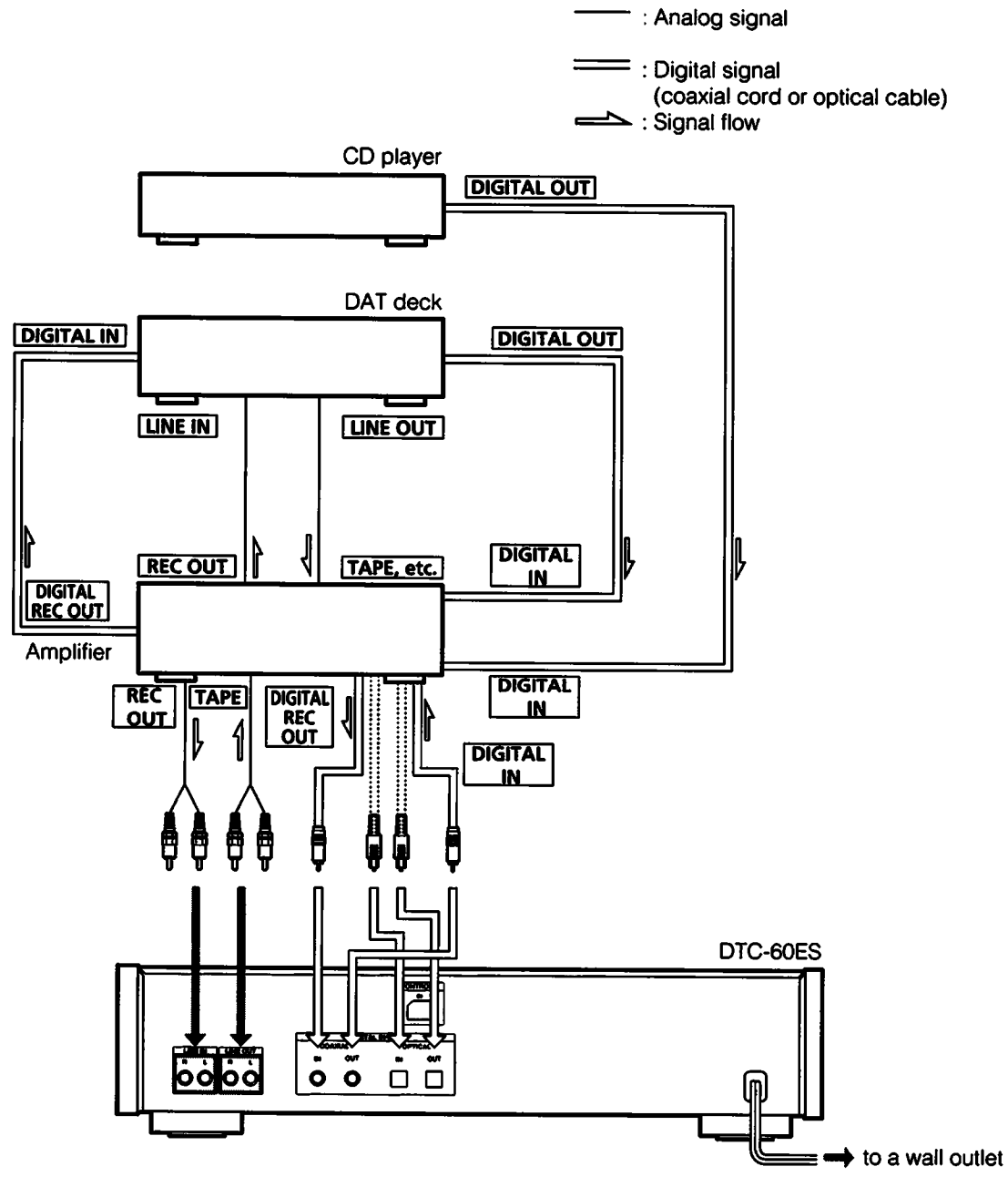
Jack	Required cord
LINE IN/OUT (analog input/output) jacks	Audio signal connecting cord (supplied, or optional RK-C510HG etc) 
COAXIAL IN/OUT (digital input/output) jacks	Coaxial digital connecting cord (optional VMC-10HG, etc) 
OPTICAL IN/OUT (optical transmission digital input/output) jacks	Optical cable (optional POC-15SP, etc.) 

Connecting the Remote Control System



Connection Examples

If your amplifier is equipped with digital signal jacks

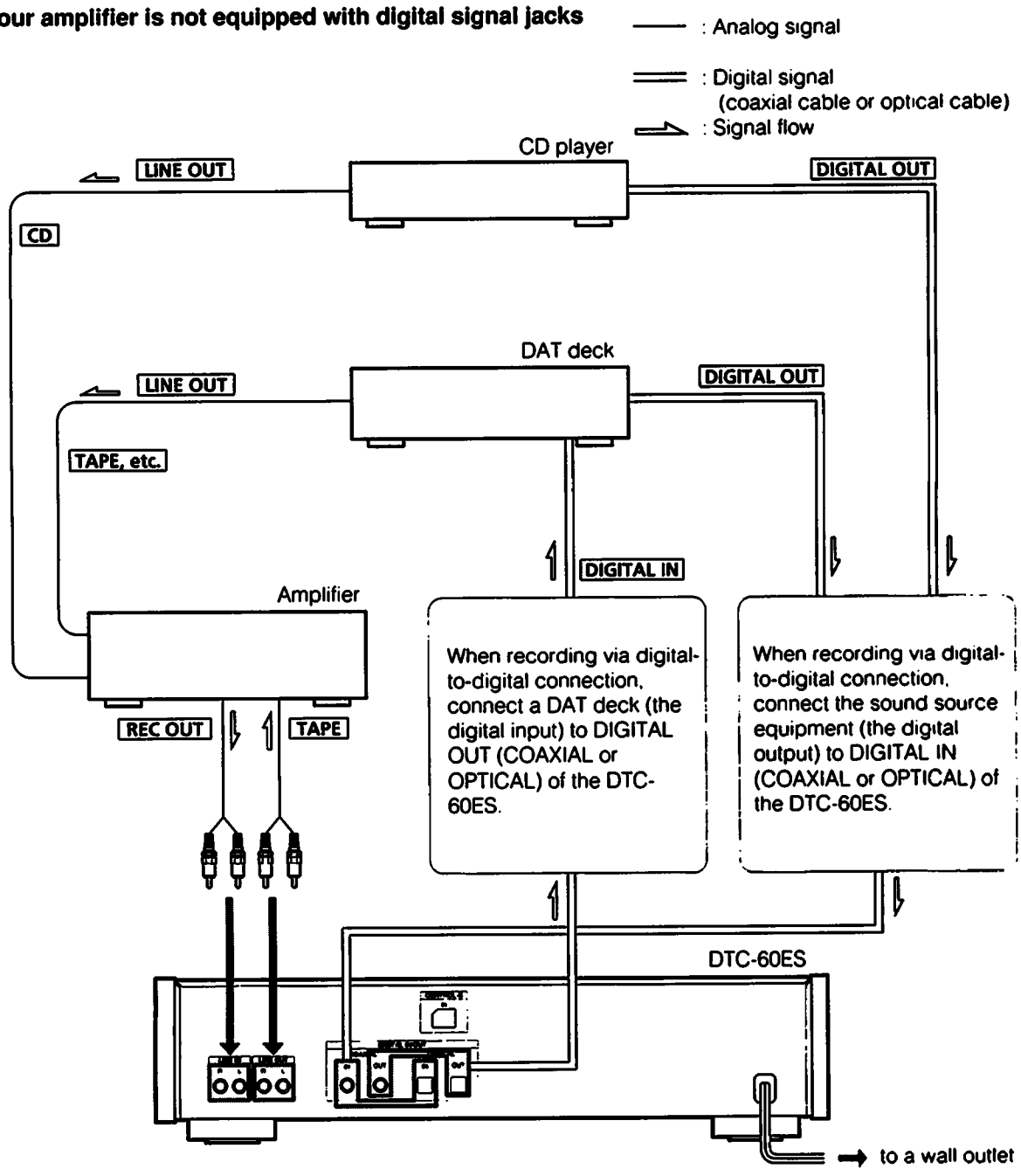


Note
If "COPY PROHIBIT" appears in the display window, recording via digital-to-digital connection cannot be performed.
In this case, connect the sound source equipment using LINE IN and OUT jacks.

Connections

Connection Examples

If your amplifier is not equipped with digital signal jacks


: Analog signal
: Digital signal
(coaxial cable or optical cable)
: Signal flow
CD player
LINE OUT
DIGITAL OUT
CD
DAT deck
LINE OUT
DIGITAL OUT
TAPE, etc.
DIGITAL IN
Amplifier
When recording via digital-to-digital connection, connect a DAT deck (the digital input) to DIGITAL OUT (COAXIAL or OPTICAL) of the DTC-60ES.
When recording via digital-to-digital connection, connect the sound source equipment (the digital output) to DIGITAL IN (COAXIAL or OPTICAL) of the DTC-60ES.
REC OUT
TAPE
DTC-60ES
to a wall outlet

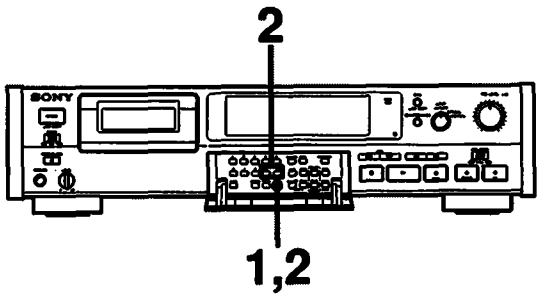
When connecting a microphone
Connecting a stereo microphone amplifier (the analog output) to LINE IN of the DTC-60ES.

Note
If "COPY PROHIBIT" appears in the display window, recording via digital-to-digital connection cannot be performed.
In this case, connect the sound source equipment using LINE IN and OUT jacks.

Clock Setting

This unit uses a built-in clock to keep track of the current date and time. Once you set the date and time, this information will be recorded on the tape along with the audio signal during recording, allowing you to check the recording date of the tape during playback at a later time.

Setting the Date and Time



1 **With the unit stopped, press the CLOCK SET button.**
The year display begins to flash.

2 **Press 9 (–) or 0 (+) to decrease or increase the displayed item, then press the CLOCK SET button.**
The next item begins to flash.

3 **Repeat step 2 until all items have been set.**
For greater accuracy, set the seconds display to zero, then press the CLOCK SET button in synchronization with a timecast (from the telephone or other time source).

To confirm the date or time
Press the PRESENT button to display the date, the day of the week or time. When pressing the PRESENT button once, the date is displayed, when pressing twice, the day of the week is displayed and when pressing three times, the time is displayed. To return to the original counter display, press the COUNTER MODE button.

Time display
The time is displayed in 12-hour format.
Midnight and noon are displayed as follows:
Midnight: 12:00 AM
Noon: 12:00 PM

Built-in clock
This unit's built-in clock operates using a quartz oscillator, and time variations caused by changes in temperature, etc., may accumulate. For precise recording of hour, minute, and second data by the built-in date function, it is recommended that you set the clock once a week.

Precautions when setting the clock
- Set the clock while the tape is stopped.
- Although this unit's clock automatically adjusts for leap years and long and short months, do not enter a date which does not exist.

The day of the week is displayed as follows:

Sunday	SU
Monday	MO
Tuesday	TU
Wednesday	WE
Thursday	TH
Friday	FR
Saturday	SA

Note
This unit uses a back-up battery to keep the clock running when the power is turned off. The life of the battery under normal use is approximately seven years. When the battery starts to run down, the clock will stop operating normally. When this occurs, have the battery replaced at your dealer or nearest Sony Service Center (a battery replacement fee is required).

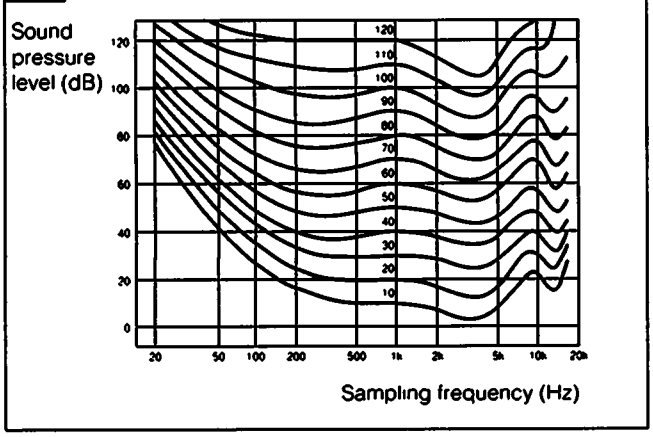
SBM (Super Bit Mapping) Function

During analog recording, the SBM function lowers noise within the frequency band to which to the human ear is most receptive to noise, thereby, sharply expanding the auditory dynamic range of the recorded signal.
To activate the function, turn on the SBM switch when recording an analog source through the analog (LINE IN) connectors except when long-play mode (32 kHz) is selected.

High-precision pulse A/D converter
The DAT deck uses a pulse A/D converter and decimation filter to convert an analog signal into a quantized 24-bit digital signal. DAT, like CDs, uses 16-bit quantization, and thus the 8-bit difference results in more precise quantization, more signal information and less quantizing noise than16-bit quantization. During conversion of the 24-bit data to a 16-bit DAT recording signal, the SBM function boosts sound quality by reintegrating into the 16-bit signal 4 bits of signal information that would normally be lost.

Applying the principle of human hearing
The SBM function applies the principle of human hearing in the reintegration of signal information. The auditory range of the human ear is generally considered to be 20 Hz to 20 kHz; hearing sensitivity, however, shows greater sensitivity to the range between 3 kHz and 4 kHz, and lower sensitivity to frequencies above and below this range (see Fig. A). This principle applies also to quantizing noise as well. By reducing quantizing noise in this particular range, signals can be recorded to produce more expansive sound than is possible by a uniform reduction of noise over the entire audible range.

A



Noise-shaping filter
The SBM function uses a noise-shaping filter (see Fig B) with a frequency response similar to that of the human ear to reduce quantizing noise within the most sensitive frequency range, and to feed back the quantizing error (that is normally lost) back to the input signal, re-integrating the low-end bit information with the high-end bit information (see Fig. B).

B

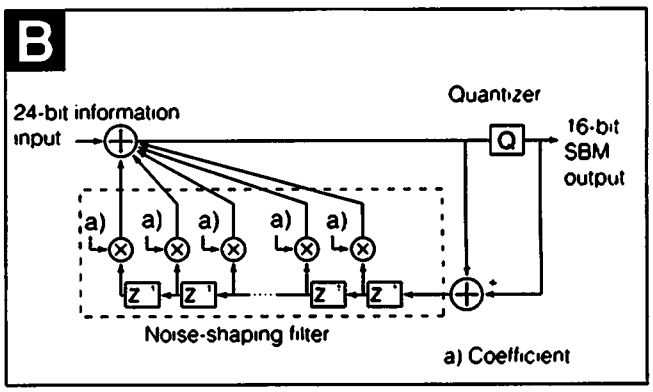
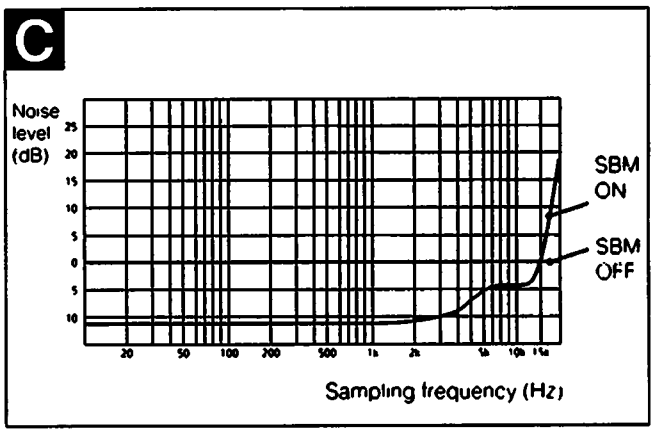


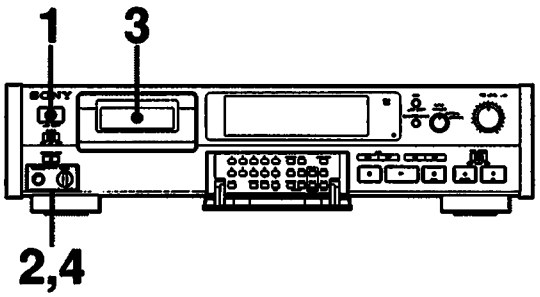
Fig. C shows the improvement in the quantizing noise level when the SBM switch is on. Given a noise level of 0 dB when the SBM switch is off, the improvement in noise level for sampling frequencies lower than 3 kHz exceeds 10 dB when the SBM is activated

C



The SBM function operates only during recording The improved sound produced by the SBM function, however, can be enjoyed during playback, regardless of the SBM switch position or the DAT deck being used

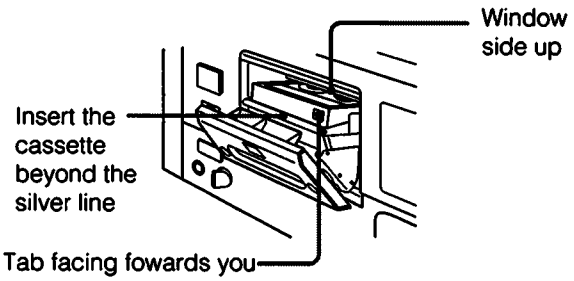
Cassette Loading



1 **Turn on the power.**

2 **Press ⏏ OPEN/CLOSE.**
The OPEN indicator appears on the display.

3 **Insert the cassette.**



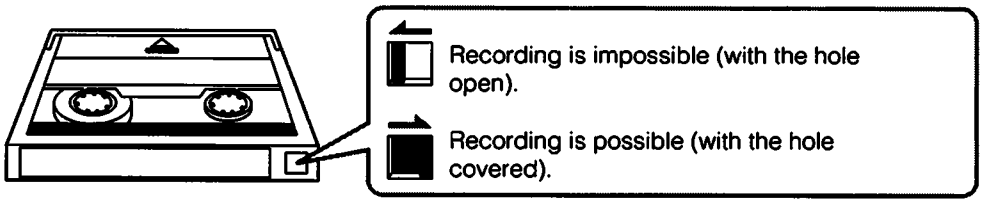
4 **Press ⏏ OPEN/CLOSE.**
The CLOSE indicator appears on the display.

To remove the cassette
Press ⏏ OPEN/CLOSE.

Digital audio tape characteristics
This deck uses only digital audio tape made especially for DAT and which has the following characteristics:
Unlike a conventional analog audio cassette tape, **digital audio tape uses only one side.**

- The digital audio tape case is designed to keep out dust. Do not open the case to expose the tape.
- The hole at the back of the tape is the detector slot. Do not cover this slot.
- Do not use thin-tape cassettes (with a playing time of over 120 minutes) since this may cause the unit to display inaccurate time information, or result in tape damage caused by abnormal operation.

To prevent accidental erasure
When a recording is made, any previously recorded signal will be erased automatically. To prevent accidental erasure, set the safety tab to the position shown in the illustration. With the hole open, rewriting sub codes cannot be performed.



Notes

- When you turn on the power, the ▮▮ indicator flashes for a moment in the display window. During this period, no buttons other than the ⏏ OPEN/CLOSE and ► buttons are operative. Wait until blinking stops and the ▮▮ indicator goes off.
- When inserting the cassette, do not push the cassette compartment closed. Be sure to use the ⏏ OPEN/CLOSE button.

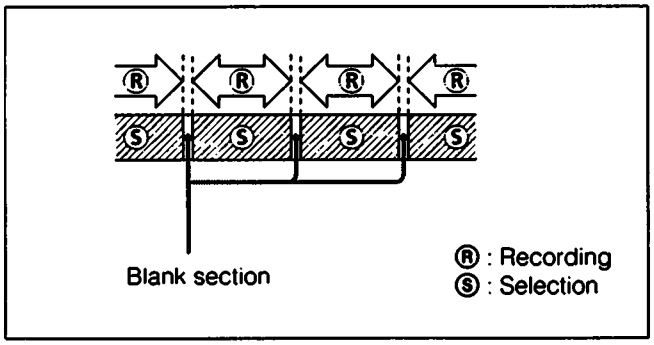
On the sampling frequency
When a cassette is inserted and a source program is played back, the sampling frequency (48 kHz, 44.1 kHz or 32 kHz) of the source program appears in the display window.

Before Recording

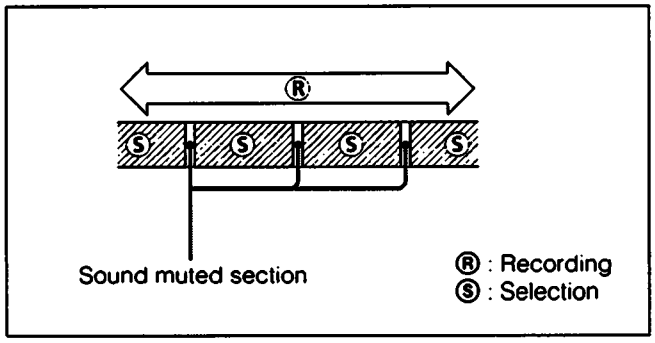
Blank Section and Sound Muted Portion

With conventional analog audio tapes, the tape portion on which no recording ever has been made and the portion on which a recording has been made but the sound is muted are treated the same, since no sound can be heard from these portions.
However, with DAT cassette, you should know that the two kinds of "no sound" portions must definitely be distinguished one from the other.

Blank section
Means the portion on which no recording ever has been applied.



Sound muted portion
Means the portion on which a recording has been applied but that no audible sound is recorded.



Important
When recording, be certain that no blank section is left on the tape. If blank sections remain on the tape, search operations using the AMS buttons, for example, may take quite a long time or the absolute time is not written correctly.

Difference between the blank section and sound-muted portion
When you record, a track format is constructed on the recorded area, even if the sound is muted during recording. On the blank section, since no recording is applied, there is no track format.

Absolute Time Codes

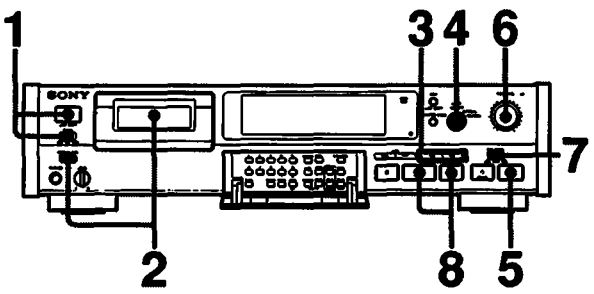
The absolute time indicates the position of the tape, giving the time elapsed from the beginning. The absolute time codes correctly written on the tape can be used in various convenient ways during playback.

Recording absolute time codes
When you record, the absolute time codes are also written automatically from the beginning of the tape
Once the absolute time codes are recorded, it cannot be re-written. With the absolute time, you can check the elapsed time from the beginning of the tape or designate the position of the tape to be played back precisely
Note, however, that the absolute time codes are not written if you start recording from the middle of blank section No blank sections should be left on the tape when recording

Tips for recording:
- To insert silence between selections, use the record muting function (page 24). Do not advance the tape with the ▶▶ or ▶ button.
- To start recording from the middle of the tape, use the end search function (page 24) to locate the beginning of the blank section. This will avoid leaving a blank section

If absolute time codes cannot be written
If the continuity of the time codes is broken by a blank section, absolute time codes will not be recorded during later recording operations.
In this case, start recording from the beginning of the tape, or from the end of the previously recorded material (located with the end search function described on page 24)

Recording



1 **Make sure that the TIMER switch is set to the OFF position, and turn on the power.**

2 **Insert a cassette and press the ≙ OPEN/CLOSE button to load the cassette. (See page 19.)**

3 **Locate the position at which you want to start recording.**

- To start recording from the beginning of the tape, press the ◀◀ button. (Pressing the ◀◀ button again at the beginning of the tape will cause the "TOC" indicator to appear.)

Note on recording from the beginning of the tape
Create a 4-second sound-muted section at the beginning of the tape with the record muting function. (See page 24.) If you do not, the beginning part of the first selection may be skipped during later playbeck.

- To start from the middle of the tape, locate the point immediately before the blank section with the end search function. (See page 24.)

4 **Set the INPUT selector to ANALOG, OPTICAL or COAXIAL depending upon your sound source.**

5 **Press the ● REC button.**
REC, ► and ❚❚ indicators light on the display, and the deck enters the record-pause mode. The sampling frequency to be applied for recording appears.
If the digital copy prohibit signal is written on the codes of the sound source, the COPY PROHIBIT indicator appears in the display window and signifies that you cannot record that source with the digital-to-digital connection. In this case, use the analog-to-analog connection.

6 **When recording the analog input signal, adjust the recording level and balance with the REC LEVEL controls respectively. (See page 23.)**
No recording level adjustment is required when recording the digital input signal.

7 **Set the REC MODE selector.**
When recording in standard mode, set REC MODE to STANDARD 48 kHz or STANDARD 44.1 kHz.
When recording in long-play mode, set REC MODE to LONG.

8 **Press the ❚❚ PAUSE or ► (play) button.**
The ❚❚ indicator goes off, and recording starts.

To write start ID automatically during recording
Make sure that the AUTO indicator is lit.
If not, press the START ID AUTO button. (See page 28.)

To designate the program number
Press the desired numeric button. (See page 30.)
When recording from the beginning of the tape, the program number will be assigned automatically from 1.

To insert sound muted portion at the beginning of the tape
Do not advance the tape with the ▶▶ or ► button. This will leave a blank section at the beginning. Be sure to proceed with the record muting function. (See page 24.)

To stop recording
Press the ■ button.
To stop recording for a moment
Press the ❚❚ PAUSE button.
When you press the FADER or ○ REC MUTE button, the deck will also enter the record-pause mode.
To release pause and restart recording
Press the ❚❚ PAUSE or ► button.
To remove the cassette
Press the ≙ OPEN/CLOSE button.

If recording cannot be made
Check the following:

- The safety tab of the cassette is not set to the record-possible position. (See page 19.)
- No cassette is loaded.
- The INPUT selector is set to the incorrect position.
- Tape is fully rewound to the end.
- The output level of the playback equipment is too low.
- The digital copy prohibit signal is written in the codes of the sound source you want to record. (The COPY PROHIBIT indicator appears in the display window.)
- The REC LEVEL controls are set to the 0 position. (Only when recording the analog input signal.)

Recording

Note on the INPUT selector and the REC MODE selector
Do not change the position of these selectors after recording starts. If you do, the wrong "PGM TIME" information may appear in the display window.

Note on the SBM switche
To obtain uniform characteristics in the recorded sound, do not change the setting of the SBM switch after recording starts.

If the cassette is ejected after it has been loaded
Check to see if the cassette is inserted correctly. (See page 19.)

When the tape is recorded to the end (Auto rewind function)
The tape is rewound to the beginning and stops automatically.
The auto rewind function is not applied when the TIMER switch is set to the REC position.

Accuracy of the electronic linear time counter
The linear time counter provided with this unit is not a clock. The time indicated by the counter may differ slightly from the actual recording/playback time.

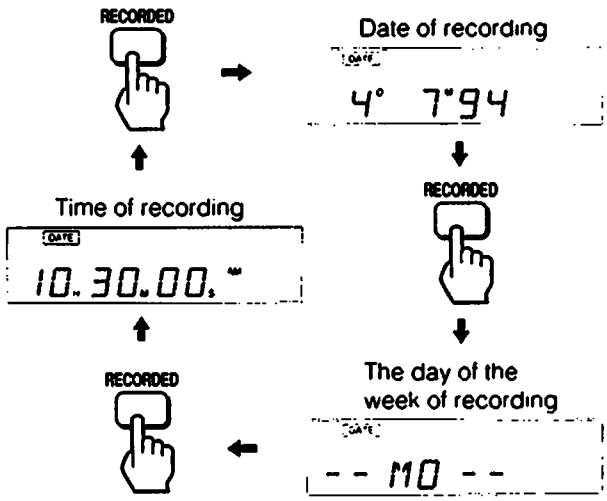
To Store the Recording Date and Time

Once the built-in clock is set, the day, the day of the week and time of recording will automatically be recorded on the tape along with the audio signal. When playing the tape back later, you can display this information to check when the tape was recorded.
To check the day, the day of the week and time being recorded, press the PRESENT button to display the current date and time.

Note
If you use another DAT deck to record subcodes (using the renumbering function, etc.) on a tape initially recorded on this unit, the recording date and time data may be erased from those sections of the tape.

To Check the Recording Date and Time

During playback you can check the recording day, the day of the week and time which was recorded on the tape at the same time the audio signal was recorded (No display will appear if the recording date and time are not recorded on the tape.)
To display the recorded date and time, press the RECORDED button. Each press of the button changes the display according to the following sequence.



To check the current date and time
Press the PRESENT button. The day, the day of the week and time are displayed in the same way as with the RECORDED button.

Recording level adjustment (for analog input signals only)

The peak level meters have a peak hold function which indicates the peak level of the analog input signal momentarily. The MARGIN indicator shows how much margin there is between the peak level of the input audio signal and 0 dB. Whenever a signal having a higher level than the displayed one is input, the new level replaces the lower one on the MARGIN indicator.

Turn the REC LEVEL controls so that the "OVER" segments do not light, even at the highest level.

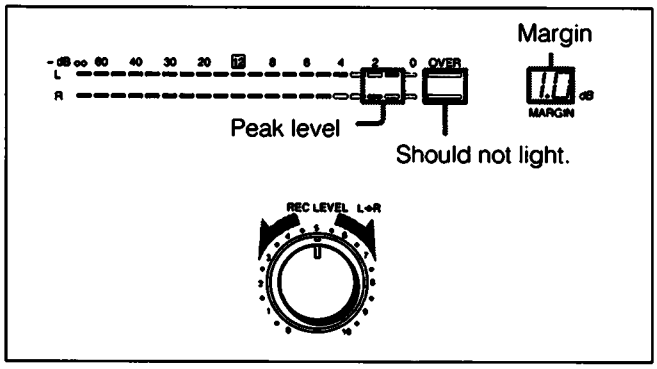
To reset the margin

Press MARGIN RESET. The margin will become "- -".

If the level exceeds 0 dB

The "OVER" segments light in red, and "0.0 dB" flashes.

If "OVER" lights steadily, lower the recording level so that the peak level meter lights between –12 dB (12) and 0 dB to avoid sound distortion.



If you keep adjusting the recording level with the unit in the record-pause mode

If the unit is left in the record-pause mode for more than 10 minutes, the record-pause mode will be released automatically, and the unit will enter the stop mode.

The levels of the input audio signals appear even in the stop mode, and you can continue to adjust the recording level. (The "AD-DA" indicator appears on the display.)

In the above case, press the ● REC button again to set the unit to record-pause mode.

If the unit is left in the record-pause mode for more than 10 minutes during digital recording

The record-pause mode will be released automatically, and the unit will enter the stop mode. (The "-DA" indicator appears on the display.) In this case, press the ● REC to set the unit to record-pause mode.

If the cable is disconnected or the program source is intermitted, the digital input signal will be interrupted during digital recording

The OPTICAL or COAXIAL indicator flashes and the unit will enter record-pause mode (for about 10 minutes). If the digital signal is input again in this period, the unit will enter recording mode automatically.

Recording Mode

The following table show the recording mode for various input signals and REC MODE selector settings.

Input signal	REC MODE selector position	Recording mode
Analog input signal	STANDARD (48 kHz)	Standard play (48 kHz)
	STANDARD (44.1 kHz)	Standard play (44.1 kHz)
	LONG	Long play (32 kHz)
Digital input signal (32 kHz)	STANDARD (48 kHz)	Standard play (32 kHz)
	STANDARD (44.1 kHz)	
	LONG	Long play (32 kHz)
Digital input signal (44.1 kHz)	STANDARD (48 kHz)	Standard play (44.1 kHz)
	STANDARD (44.1 kHz)	
	LONG	
Digital input signal (48 kHz)	STANDARD (48 kHz)	Standard play (48 kHz)
	STANDARD (44.1 kHz)	
	LONG	

( ): sampling frequency

Note

Digital input signals with a sampling frequency of 44.1 kHz or 48 kHz are recorded only in standard mode and at their original sampling frequencies, regardless of the REC MODE selector setting.

The longest recording period at each mode

Mode / Cassette	The longest recording period	
	standard	long
DT-120	2 h	4 h
DT-90	1 h 30m	3 h
DT-60	1 h	2 h

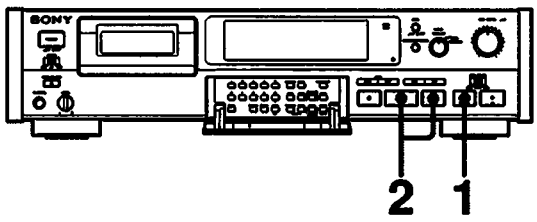
(h: hour, m: minute)

The timer counter in the long-play mode

Tape running time, absolute time and total remaining of the tape appears, based on those in the standard mode. To obtain the actual time, double each value.

Recording

Creating a Sound Muted Portion (Record Muting)



1 **During recording or record-pause mode, press the O REC MUTE button where a sound muted portion is required.**
The REC indicator flashes and the record muting is activated. After about 4 seconds, the REC indicator shows a steady light, and the II indicator lights. The deck enters the record-pause mode.

2 **To resume recording, press the II PAUSE or ► (play) button.**
Recording resumes.

Using sound muted portion
If you intend to dub the DAT cassette onto an analog cassette tape, we recommend that you insert sound muted portions between selections on the DAT cassette.
This will ensure that the AMS function of the analog cassette deck works correctly for the recorded tape.

Note
With DAT deck, the AMS function is realized by using the start ID code. (See page 27.)

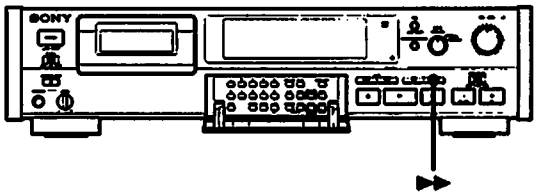
Caution
To place a space on a DAT cassette, you must not advance the tape with the ►► or ► button. If a space is created this way, no absolute time code will be recorded on the succeeding area, and you cannot check the elapsed time of the tape.

To create a sound muted portion of more than 4 seconds
Keep the O REC MUTE button pressed for as long as you want to make a recorded portion with no signals. After about 4 seconds, the REC indicator flashes rapidly. When you release the O REC MUTE button, the deck enters the record-pause mode.
The interval between selections is indicated in the MARGIN display.

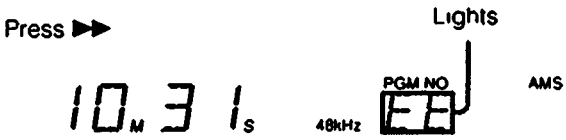
To create a sound muted portion of less than 4 seconds
Press the O REC MUTE button, and then the II PAUSE button while the REC indicator is flashing.

To start recording in the rec mute mode
Press the ● REC button while the REC indicator is flashing.

End Search



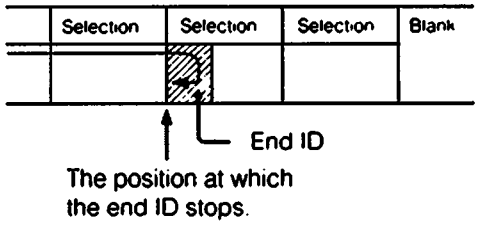
If the previous recording was applied to the middle of the tape, you must locate exactly the last point of the recorded area, and start the new recording from this point This will prevent leaving a blank section on the tape
If you want space between the last recording and the new recording, use the O REC MUTE button to mute the sound



The last point of the previous recording (the beginning of the blank section or the beginning of the end ID*) is located, and the tape stops. When the end ID is detected, the "EE" indicator lights at the PGM NO. display

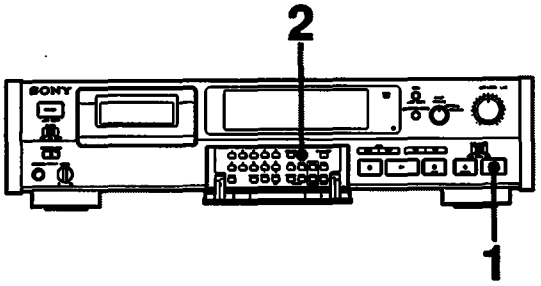
Note
If the point where you pressed the ►► button is blank, the end search operation will not function

When the end ID is written before a blank section
* The end search operation stops at the beginning of this end ID as illustrated below.



Note on the duration of a blank section
The blank section must last for more than 9 seconds for the end search operation to function correctly

Fade-in/Fade-out Recording



Fade-in recording

1 **Press the ● REC button at the starting point of recording.**
The deck enters the record-pause mode.

2 **Press the FADER button at the point where you want to start fading in.**
The FADE indicator flashes, and the sound fades in.
To return to the original volume level, immediately during a fade-in recording, press the ● REC button.

Fade-out recording

Press the FADER button at the point where you want to start fading out.
The FADE indicator flashes, and the sound being recorded fades out.
A countdown starts, and the deck enters the record-pause mode after the 0.0s indicator appears.

To enter the record-pause mode immediately during a fade-out recording
Press the ❚❚ PAUSE button.

To designate a desired duration of fade-in/fade-out
You can designate a desired duration of fade-in/fade-out, from 1.0 seconds to 15 seconds. Fade-in/fade-out is performed in 5 seconds unless you designate a different duration.
If you turn off the unit after designating the desired duration of fade-in/fade-out, the duration remains memorized.

1 **Choose either FADE or FADE by pressing the FADER button in the stop mode.**

2 **Designate a desired duration by pressing ◀◀ or ▶▶ .**
Each time pressing ◀◀ or ▶▶ , a duration in the display changes as follows:
from 1.0 sec. to 3.0 sec.: in 0.2 sec. intervals
from 3.0 sec. to 5.0 sec.: in 0.4 sec. intervals
from 5.0 sec. to 15 sec.: in 1 sec. intervals.

CD Synchronized Recording

If a Sony compact disc player with a remote commander is available, you can start playback of the CD player and the recording of the DAT deck simultaneously, with the remote commander of the DAT deck.

Position the remote commander so that the signal reaches the remote sensor of both the DAT deck and the CD player.

To start recording

This function can be performed only with the remote commander.

1 **Insert a cassette.**

2 **Insert the disc in the CD player.**

3 **Press the CD SYNCHRO STANDBY button on the remote commander of the DAT deck.**
The deck enters the record-pause mode.

4 **Press the CD SYNCHRO START button on the remote commander of the DAT deck.**
Recording on the DAT deck starts, and about 1 second later, playback of the CD player starts.

To stop recording

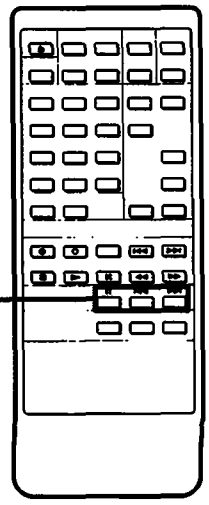
Press the CD SYNCHRO STOP button on the remote commander of the DAT deck.

Notes

- To momentarily stop recording of the DAT deck and playback of the CD player simultaneously, press the ❚❚ PAUSE buttons on both the DAT deck and the CD player.
- If your CD player has a fast start up time, it may begin playing before recording starts on the deck. To prevent this, skip step 4, and press ▶ or ❚❚ PAUSE on the DAT deck in step 4, then the play button on the CD player 2 or 3 seconds later.

To control the CD player with the remote commander of the DAT deck

The following operations are possible:
Playback: Press the ❚❚ button twice.
Pause: Press the ❚❚ button once.
AMS: Press the ⏮ or ⏭ button.
When a desired selection is located using the above operation, you can start CD synchronized recording.



Sub Codes

In addition to the ordinary audio signals, various control codes called sub codes can be recorded on the DAT cassette tapes to ease recording and reproducing operation.
A desired selection can be called up or time information can be displayed using the sub codes, for example.
The sub codes such as start ID, program number, skip ID, end ID and program time, absolute time and date function (recording the date) are available on this unit.

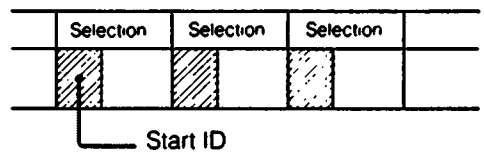
- Sub codes are written on the tape separately from the audio signals, so the audio signals are not affected.
- Sub codes, except the absolute time and the date function, can be rewritten after the audio signal recording has been completed.
  The recorded audio signals are not affected by the rewritten sub codes.

- When you record the tape with sub codes written onto a new tape via digital-to-digital connection, the sub codes to be written on the new tape are following

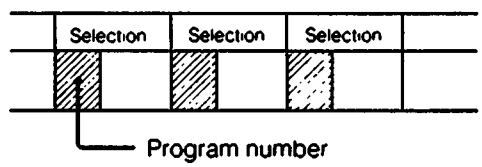
Start IDs	The same as the codes written on the original tape
Skip IDs	The same as the codes written on the original tape.
Program Numbers	New ones will be written according to the DAT deck you use
Absolute time	New ones will be written
End ID	The one written on the original tape will not be written
Date function	The one written on the original tape will not be written

When you use analog-to-analog connection, no sub codes on the original tape will be written onto a new tape New codes will be written according to the DAT deck you use

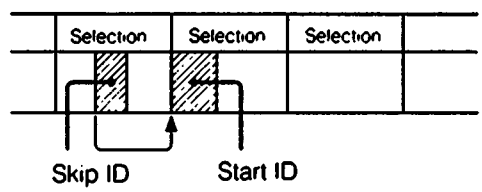
Start ID
This signal indicates the start of a music selection. You can locate the position of the start ID precisely. This signal should be written at the beginning of the selection.



Program number
This signal gives a number to selection. You can record it where the start ID is written. By designating this number, you can choose the desired selection directly or program selections in a desired order.

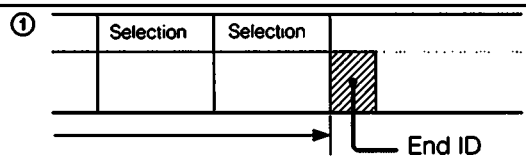


Skip ID
This signal can be marked on the selection wherever you wish. When the SKIP PLAY indicator is lit during playback, the deck will skip at high speed from where the skip ID is marked to the next start ID, and then playback will start again. Record this skip ID at the beginning of portion you want to skip.



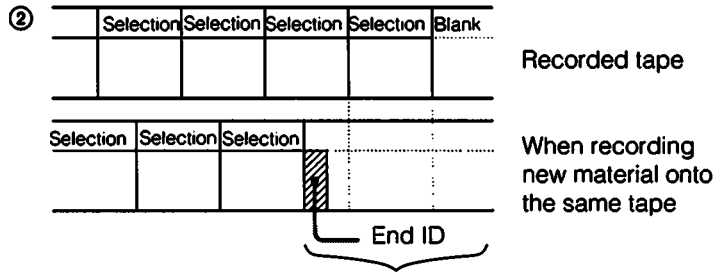
End ID
This signal indicates the end position of a recording.

① When you do not want to listen to the very end of a tape, record the end ID at the beginning of the portion you do not want to play. When the end ID is detected during playback, playback stops and the tape is rewound to the beginning automatically.



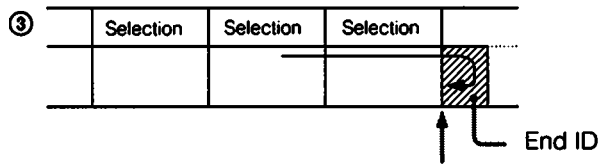
During playback, the tape is automatically rewound to the beginning.

② When recording new material on a recorded tape, you can write an end ID at the end of the re-recorded portion. This will help you easily find the position to start recording the next time when you want to record other material onto the same tape.
Like a start ID or skip ID, end ID can also be erased later.



Portion where you have not made a second recording (This first recording has not be erased.)

③ When an end ID which has been written is detected during locating selections or rehearsal playback of start ID or skip ID, the unit stops at the beginning of the end ID.



Absolute time
The absolute time indicates the position of the tape, giving the time elapsed from the beginning. The absolute time is recorded automatically at the same time the audio signal is recorded. It cannot be re-recorded. The absolute time allows you to confirm the elapsed time from the beginning of the tape.

Program time
This is the time elapsed for a selection.

The date function (Recording a date)
With the built-in clock, the day, the day of the week and time of recording are automatically recorded.

When using the sub codes

Things that can be done	Required sub code(s)
Locating a selection (AMS function)	Start ID
Listening to the first portion of selections sequentially (Music Scan)	Start ID
Choosing a selection directly	Start ID/Program number
Programming desired selections in a desired order (RMS play)	Start ID/Program number
Skipping the portion not desired	Skip ID/Start ID
Looking for the position at which the recording or playback ends	End ID
Checking the recording date and time	Date (It is recorded automatically.)

Start ID

The start ID indicates the beginning of each selection. You can start playback from the start ID position. (See page 26 for details.)

There are three ways to write start ID:
- Writing automatically during recording
- Writing manually at the desired position during recording
- Writing manually at the desired position during playback

Note
While the start ID is being written, all buttons except the ■ button are not operative.

Writing Automatically During Recording

1 **Make sure that the AUTO indicator is lit. If it is not, press the START ID AUTO button.**
When turning on the power and inserting a cassette with its safety tab at the record-possible position, the AUTO indicator lights automatically.
In time recording, this indicator will be the same as the one before the power is turned off. Start IDs will be recorded automatically when the AUTO indicator lights.

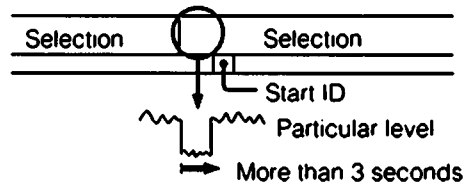
2 **To start recording, press the ● REC button, then press the II PAUSE or ► (play) button.**
When the non-signal level lasts for more than 3 seconds and a selection then starts, the start ID is written for 9 seconds (18 seconds in the long-play mode).
While a start ID is being written, the START ID indicator blinks on the display.

Why 9 seconds or 18 seconds are necessary for writing a start ID ?
A start ID requires 9 or 18 seconds to allow to be detected when rewinding/fast-forwarding a tape. (The speed is 200 times as fast as that of normal tape operation.)
After the start ID is located, the tape returns to the beginning of the start ID if necessary, and playback starts from the beginning of the selection.

If the signal level stays very low for more than 3 seconds
If there is a portion of very low volume level during a selection, a start ID may be written even in the middle of the selection. An unwanted start ID can be erased later. (See page 29.)

When the portion between selections is not clear
The start ID position may not coincide exactly to the beginning of the selection. To shift the start ID position, see "Shifting Start IDs' and Program Numbers Position" on page 31.

Illustration of writing a start ID



When recording from a CD player
If the auto space function is available with your CD player, activate this function to ensure that the start IDs are written correctly.

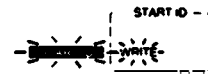
When recording from another DAT deck through the digital input/output jacks
If the START ID AUTO indicator on the recording DAT deck is lit, start IDs on the source cassette are automatically recorded in their original sequence If not, start IDs are not recorded even if the source cassette has start IDs

Writing Manually During Recording

1 **Make sure that the AUTO indicator is off. If it is not, press the START ID AUTO button to turn it off.**

2 **To start recording, press the ● REC button, then press the II PAUSE or ► (play) button.**

3 **At the desired position, press the START ID WRITE button.**
The WRITE indicator lights.
The start ID is written for 9 seconds (18 seconds in the long-play mode) from the point where you pressed the START ID WRITE button. While a start ID is being written, the START ID indicator flashes



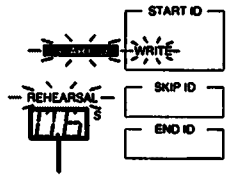
Writing Manually During Playback (Rehearsal Function)

During playback, start IDs can be written at the desired position more accurately than during recording.
Make sure that the safety tab of the cassette is closed.

1 **Press the ► button to start playback. At the desired position, press the START ID WRITE button.**
The REHEARSAL indicator lights and the WRITE and START ID indicators flash, and the position for 3 seconds from the point where you pressed the START ID WRITE button is played back repeatedly (rehearsal function). The beginning of the repeated portion will be the beginning of the start ID.

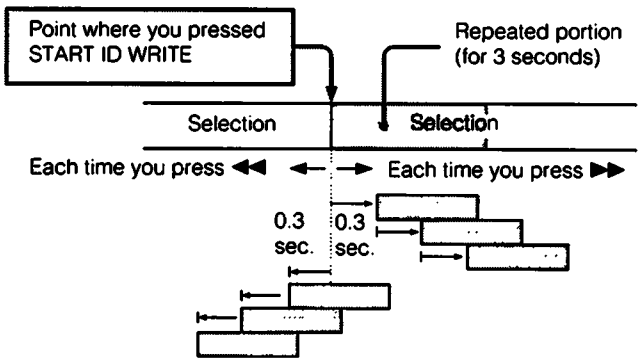
2 **Press the ◄◄ or ►► button to adjust the "repeat start" point.**
The "repeat start" point is shifted backward with the ◄◄ button or forward with the ►► button by about 0.3 of a second.
The indicator at the MARGIN display shows how much the "repeat start" point is shifted from the point where you pressed the START ID WRITE button.

3 **After setting the beginning of the start ID at the desired point, press the START ID WRITE button again.**
The WRITE indicator lights steadily and the start ID is written. The program number is not written in this time.



When you pressed ►► twice.

Illustration of the rehearsal function



Normally, the repeated portion is played back 5 times. When the ◄◄ or ►► button is pressed while the repeated portion is played back, the repeated portion is played back up to 8 times max, and then tape stops.

Avoid positioning start IDs near the start or end of the tape

- A start ID positioned within 2 seconds of the beginning of the tape may be difficult to reposition* or erase on this unit or other Sony DAT units. For this reason you should use the record muting function (see page 24) to write a 4-second sound-muted section at the beginning of the tape before you start recording.
- Start IDs positioned within 10 seconds of the tape end may also be difficult to reposition, as well as renumber, and should thus be erased if possible.

* When a start ID is located close to the start of the tape, any attempt to move it closer using the rehearsal function will cause the MARGIN display to 0.0s, indicating that further movement is impossible.

- The unit may stop when you press the START ID WRITE button in step 3 if the location of the start ID is too near the beginning of the tape or immediately after a blank section.

Adjusting the Position

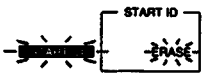
To finely adjust the position of a start ID written automatically during recording, use the rehearsal function described on the left column.
You can shift the start ID position about 2 seconds (about 4 seconds in the long-play mode) backward or forward. To shift it for more than 2 seconds, first erase the start ID (see below) and rewrite it manually.

1 **During playback, press the START ID WRITE button where the start ID to be shifted is written.**

2 **Perform steps 2 and 3 described on the left column, "Writing Manually during Playback."**

Erasing

While the start ID you want to erase appears on the display during playback or in the stop mode, press the START ID ERASE button. Make sure that the safety tab of the cassette is closed.
That start ID is erased.
The ERASE indicator flashes while the start ID is detected.
While the start ID is being erased, the ERASE indicator lights and the START ID indicator flashes.



If you press the START ID ERASE button during the stop mode or while the START ID indicator is not on the display
The start ID just before the current position is erased.

When a start ID is erased
If a program number is also written with the start ID, both codes will be erased at the same time.

Program Numbers

Program numbers are the codes indicating the selection order. (See page 26 for details.)
There are two ways to write program numbers:
- Writing automatically during recording
- Renumbering automatically during playback or in the stop mode (Renumbering function)

Writing Automatically During Recording

When you proceed so that start IDs are written automatically during recording, the program numbers are also written.

Writing program numbers from the beginning of the tape

1 **The AUTO Indicator must be lit. If it is not, press the START ID AUTO button.**
When turning on the power and inserting a cassette with its safety tab at the record-possible position, the AUTO indicator lights. In timer recording, the AUTO indicator will be the same as the one before the power is turned off.

2 **To start recording, press the ● REC button, then press the II PAUSE or ► (play) button.**
The program numbers will be written in numerical order from "1" at the same position as the start IDs.

Writing program numbers from the middle of the tape

1 **To locate the last point of the previous recording, using the end search function. (See page 24.)**
It is important to proceed with the end search function in order not to leave a blank section on the tape.

2 **The AUTO Indicator must be lit. If it is not, press the START ID AUTO button.**
When turning on the power and inserting a cassette with its safety tab at the record-possible position, the AUTO indicator lights.
In timer recording, the AUTO indicator will be the same as the one before the power is turned off.

3 **Press the ● REC button to set the deck in the record-pause mode.**

4 **Designate the next program number (the number that follows the program number of the last selection) with the numeric button.**
If you are not aware of the program number, press the ⏮ button to check the last program number (After checking the program number, locate the last point of the previous recording, using the end search function.)
If the program number of the last selection appears at the PGM NO. display, you need not to designate the next number.

5 **Press the II PAUSE or ► (play) button.**
The program numbers are written for about 9 seconds (about 18 seconds in the long-play mode) consecutively, beginning from the designated number

If the next program number is not designated in step 4
The start IDs will be written, but the program numbers will not.
You can write the program numbers using the renumbering function described on the next page.

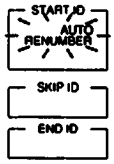
Renumbering

If you record from the beginning to the middle of a tape on which another recording has ever been applied, the same program number may be written twice on that tape. If you omit designating the next program number when recording from the middle of the tape, the succeeding program numbers are not written.
In such cases, proceed as follows to renumber the program numbers from the beginning of the tape at a high speed.

Renumbering Program Numbers Automatically

1 **Make sure that the AUTO indicator is lit, and that the safety tab of the cassette is at the record-possible position.**
If the AUTO indicator is not lit, press the START ID AUTO button.

2 **Press the RENUMBER button during playback or in the stop mode.**
The tape will automatically be rewound to the beginning, and the program numbers are re-arranged from "1" in numerical order at each start ID position.
While the program numbers are rewritten, the START ID indicator flashes and while the tape is fast-forwarded to the next start ID, the AUTO RENUMBER indicator flashes.
When program numbers are written correctly, the tape is fast-forwarded to the next start ID.

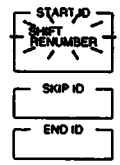


When renumbering is terminated
The tape is automatically rewound to the beginning, and the deck enters stop mode.

Shifting Start IDs' and Program Numbers Position
The start ID position may not coincide exactly to the beginning of the selection, especially when the portion between selections is not clear. On such a tape, the very beginning of the selection cannot be located using the AMS function. If this happens, you can shift the start ID and program number position, however, you cannot shift the position of the program number 1.

1 **Make sure that the AUTO indicator is off, and that the safety tab of the cassette is at the record-possible position.**
If the AUTO indicator is lit, press the START ID AUTO button.

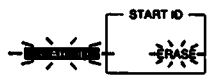
2 **Press the RENUMBER button during playback or in the stop mode.**
The start ID and program number position of the 2nd selection, and the succeeding selections, will be shifted forward by about 0.3 of a second.
When program numbers are written incorrectly, the renumber function operates.



Erasing

Make sure that the safety tab of the cassette is closed.

During playback, press the START ID ERASE button while the program number to be erased appears in the display window.
That program number is erased. The start ID at the same position will also be erased.
The ERASE indicator flashes while the program number is being searched for, and the START ID indicator flashes while the program number is being erased.



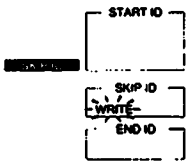
When the program number is erased
Playback continues. The succeeding program numbers remain unchanged. To re-arrange the program numbers, renumber them as described on the left column.

Skip ID

When the skip ID is detected during playback, the tape skips to the next start ID position, and the normal playback resumes. (See page 26 for details.)

Writing During Recording

Press the SKIP ID WRITE button at the beginning of the portion you want to skip later.
The SKIP ID and WRITE indicators light momentarily.
The skip ID is written for about 1 second (2 seconds in the long-play mode) from where you pressed the button.

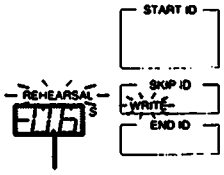


Writing During Playback (Rehearsal Function)

During playback, skip ID can be written at the desired position more accurately than during recording. Make sure that the safety tab of the cassette is closed.

1 **During playback, press the SKIP ID WRITE button at the desired position.**
The REHEARSAL indicator lights and the WRITE indicator flashes, and the portion for 3 seconds to the point where you pressed the SKIP ID WRITE button, is played back repeatedly (rehearsal function).
The end of the repeated portion will be the beginning of the skip ID.

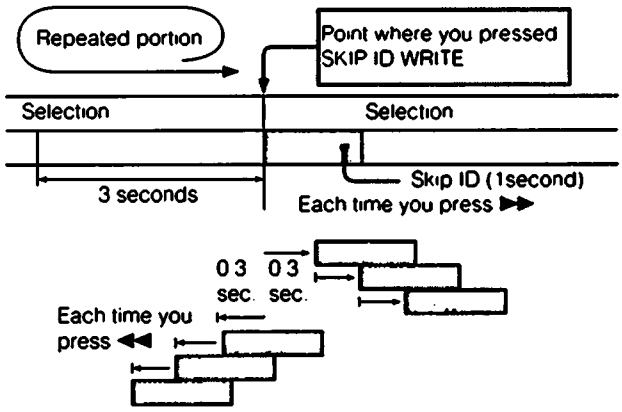
2 **Press the ◀◀ or ▶▶ button to adjust the "repeat end" point.**
The "repeat end" point shifted backward with the ◀◀ button or forward with the ▶▶ button by 0.3 of a second.
The indicator at the MARGIN shows how much the "repeat end" point is shifted from the point where you pressed SKIP ID WRITE.



When you pressed ◀◀ twice.

3 **After setting the beginning of the skip ID at the desired point, press the SKIP ID WRITE button again.**
The SKIP ID indicator lights, and the skip ID is written.

Note on the point where a skip ID is written
During rehearsal function, a skip ID will be written at the end of the repeated portion as illustrated

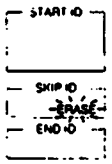


Normally, the repeated portion is played back 5 times
When the ◀◀ or ▶▶ button is pressed while the repeated portion is played back, the repeated portion is played back up to 8 times max, and then tape stops

Erasing

Make sure that the safety tab of the cassette is closed

During playback or in the stop mode, press the SKIP ID ERASE button immediately after the skip ID to be erased.
The tape is rewound to the nearest skip ID position and the skip ID is erased.
The ERASE indicator lights while the skip ID is being searched for and goes off when the skip ID is erased



Precaution
When the skip ID and the start ID are overwritten, the skip ID will also be erased if the start ID is erased

ID to be erased	Operation
Start ID, skip ID	Press the START ID ERASE button.
Skip ID	Press the SKIP ID ERASE button.

End ID

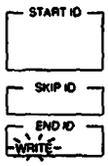
The end ID indicates the last position of the recording or playback. While recording on the same tape has been done several times, you can locate the point where the previous recording terminates quickly, using the end ID.
When the end ID is detected during playback, the playback stops and the tape is rewound to the beginning automatically.

Writing During Recording

1 Press the II PAUSE, O REC MUTE or FADER button.

The button you pressed	The mode of the deck
II PAUSE	Record-pause mode
O REC MUTE	Record-pause mode after a sound muted portion is created for 4 seconds.
FADER	Record-pause mode after the sound fades out.

2 Press the END ID WRITE button.
The END ID WRITE indicator lights.



3 Press the II PAUSE or ► (play) button to release the record-pause mode.
The "EE" indicator appears on the display.
The end ID is written for about 9 seconds (18 seconds in the long-play mode). Tape returns to the beginning of the end ID after the end ID is written.

After you write an end ID
The portion after the end ID position cannot be played back. (The "EE" indicator appears at the PGM NO. display.) Erase the end ID (page 34) where you want to play back the portion after the end ID position.

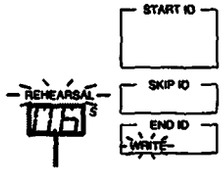
Note on the end ID position
Do not write an end ID at the same position of an existing start ID or skip ID.

Writing During Playback (Rehearsal Function)

- During playback, no end ID can be written on a blank section.
- To write the end ID just before a blank section with the end search function, perform "Writing during Recording" described on the left colums.
- Make sure that the safety tab of the cassette is closed.

1 During playback, press END ID WRITE at the desired position.
The REHEARSAL indicator lights and the WRITE indicator flashes, and the portion for 3 seconds to the point where you pressed the END ID WRITE button, is played back repeatedly (rehearsal function).
The end of the repeated portion will be the beginning of the end ID.

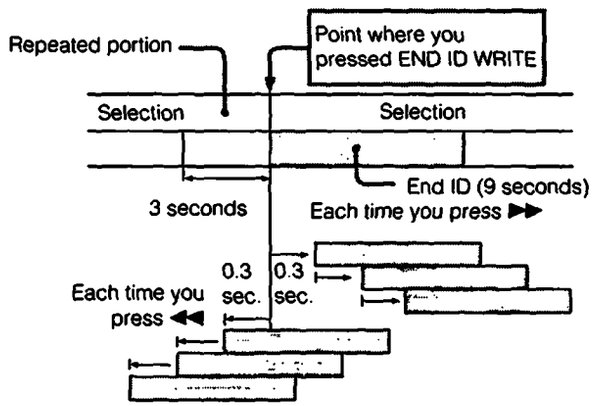
2 Press the ◄◄ or ►► button to adjust the "repeat end" point.
The "repeat end" point is shifted backward with the ◄◄ button or forward with the ►► button by 0.3 of a second.
The indicator at the MARGIN display shows how much the "repeat end" point is shifted from the point where you pressed the END ID WRITE button.



When you pressed ►► twice

3 After setting the beginning of the end ID at the desired point, press the END ID WRITE button again.
The "EE" and WRITE indicators light, and an end ID is written.

Note on the point where an end ID is written
During rehearsal function, an end ID is written at the end of the repeated portion as illustrated.



Normally, the repeated portion is played back 5 times. When the ◄◄ or ►► button is pressed while the repeated portion is played back, the repeated portion is played back up to 8 times max, and then tape stops.

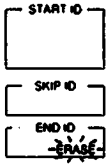
End ID

Erasing

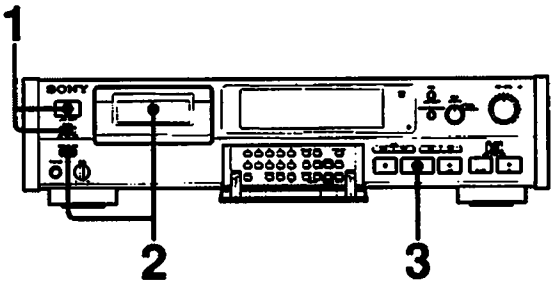
Make sure that the safety tab of the cassette is closed.

1 **Search for the beginning of the end ID with the ▶▶ button. (See page 24.)**
When the end ID is detected, the "EE" indicator lights.

2 **Press the END ID ERASE button.**
The END ID ERASE indicator lights while the end ID is being searched for and then goes off when the end ID is erased.



Playback



1 **Make sure that the TIMER switch is set to the OFF position, and then turn on the power.**

2 **Insert the cassette and press the ≙ OPEN/CLOSE button to load the cassette.**

3 **Press the ▶ (play) button.**
Playback begins.
If an end ID is written on the tape, playback stops automatically at the end ID position, and the tape will be rewound to the beginning.

To control tape transport

To stop playback	Press the ■ button
To stop playback for a moment	Press the ❚❚ PAUSE button
To release pause and restart playback	Press the ❚❚ PAUSE or ▶ button
To remove the cassette	Press the ≙ OPEN/ CLOSE button
To rewind or fast-forward the tape	Stop the tape and press the ◀◀ or ▶▶ button

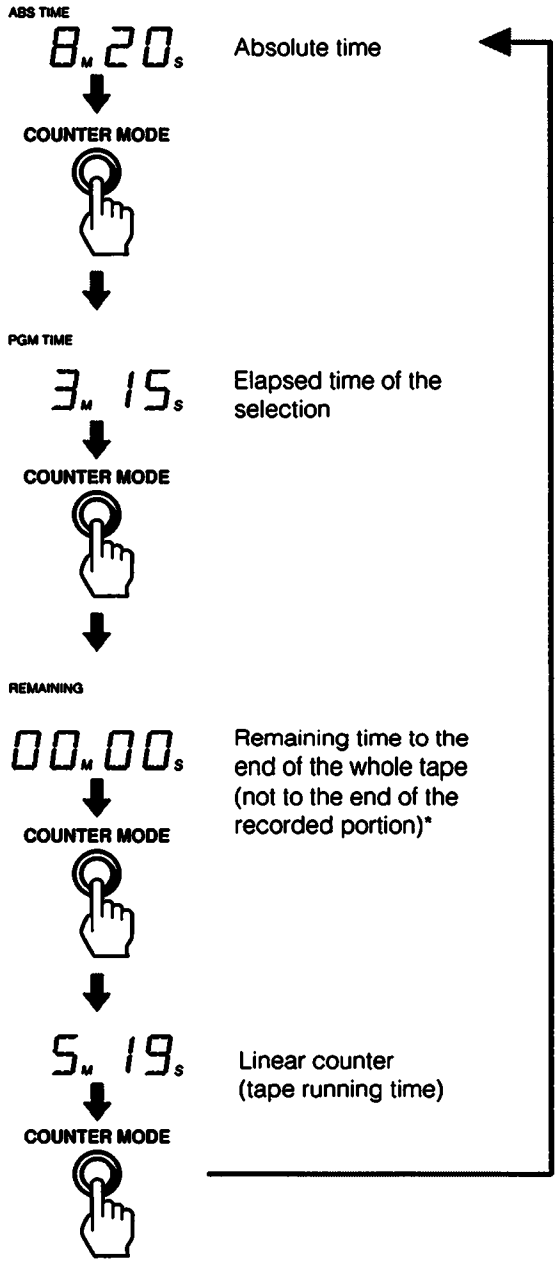
Cue/review operation

To advance the tape (cue)	Press the ▶▶ button during playback	Sound is heard while the button is pressed. Release the button at the desired point. Playback resumes
To rewind the tape (review)	Press the ◀◀ button during playback	

The speed of the tape increases about 4 seconds after the cue or review starts.

Display Window

Each time you press COUNTER MODE, the counter changes as follows.



Notes

- At the beginning of the tape, " ▯▯ " may appear and immediately go off at the PGM NO. indicator position depending on some types of pre-recorded tapes. (" ▯▯ " stands for "beginning".)
- To reset the counter to 0M 00s, press RESET on the remote commander.

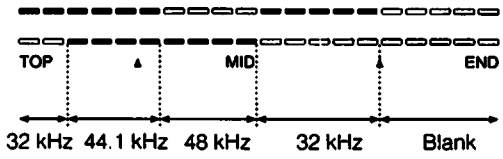
* When playing back a pre-recorded tape (software), remaining time to the end of the recorded portion appears.

To check the sampling frequencies recorded on the tape — Frequency Map

Press the 4 button on the numeric buttons while keeping the COUNTER MODE button pressed.
Bars on the level meter light to signify the sampling frequencies with which the material was recorded. (No bars light until 16 seconds (32 in the long-play mode) after playback starts.)

Sampling frequency	Level meter to be lit
32 kHz	Upper bar
44.1 kHz	Both upper and lower bars
48 kHz	Lower bar

"TOP", "MID" and "END" indicate the beginning, middle and end of each tape respectively.
Example:



To return to the peak level meter display

Press the 4 button while keeping the COUNTER MODE button pressed again.

Elapsed time of the selection does not appear when...

- The selection is played back from the middle.
- The tape is being fast-forwarded or rewound.
- The cassette compartment is opened or closed by the ⏏ OPEN/CLOSE button.

Adjusting the headphones volume

Use the PHONES-LEVEL control.

When the tape is played back to its end

The tape will be rewound to the beginning and stop automatically.

Remaining time does not appear in the following cases

- Immediately after the deck is set in the playback mode. The remaining time will appear about 16 seconds (in the standard-play mode) later.
- When playback is started from a blank section (page 20), the remaining time may not appear. Press the ◀◀ or ⏮ button.

Accuracy of the indicator for the remaining time

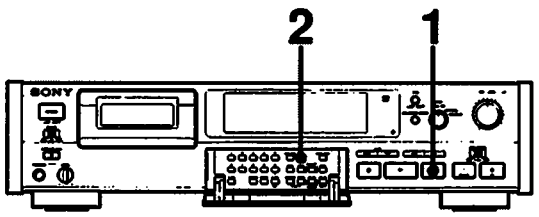
This unit indicates the remaining time by referring the thickness of the tape. So the remaining time may differ from the actual remaining time according to the type of tape.

If tape noise exists, or sound quality has deteriorated

The head may be contaminated. Clean the head, using a cleaning cassette. (See page 41).

Various Playback Operations

Fade-in Fade-out Play



Fade-in/fade-out play cannot be performed through the digital output jack.

Fade-in Play

1 **During playback or in the stop mode, press the II PAUSE button.**
The deck enters the pause mode.

2 **Press the FADER button.**
The FADE indicator flashes, and the sound fades in.

Fade-out Play

During playback, press the FADER button at the point where you want to start fading out.
The FADE indicator flashes, and the sound being played back fades out.
A countdown starts, and the deck enters the pause mode after the 0.0s indicator appears.

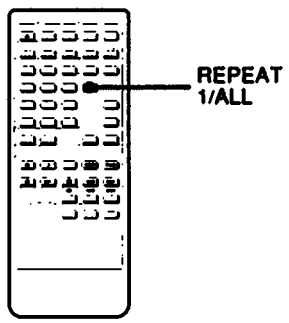
To designate a desired duration of fade-in/fade-out

You can designate a desired duration of fade-in/fade-out, from 1.0 seconds to 15 seconds.
Fade-in/fade-out is performed in 5 seconds unless you designate a different duration.
If you turn off the unit after designating the desired duration of fade-in/fade-out, the duration remains memorized.

1 **Choose either FADE or FADE by pressing the FADER button during the stop mode.**

2 **Designate a desired duration by pressing the ◀◀ or ▶▶ button.**
Each time pressing the ◀◀ or ▶▶ button, a duration in the display changes as follows:
from 1.0 sec. to 3.0 sec.: in 0.2 sec. intervals
from 3.0 sec. to 5.0 sec.: in 0.4 sec. intervals
from 5.0 sec. to 15 sec.: in 1 sec. intervals

Repeat Play



These functions can be performed only with the remote commander

Playing a Selection Repeatedly

Press the REPEAT 1/ALL button on the remote commander while the desired selection is played back.
The REPEAT 1 indicator appears
After the selection is playback, the tape is rewound to the beginning of that selection, and the playback is repeated

To stop playing a selection repeatedly
Press the ⏏ OPEN/CLOSE button to eject the cassete

Note on the end of the repeated portion during the REPEAT 1 play
The tape is rewound to the beginning of the selection to be repeated when one of the following is detected
- Start ID of the next selection
- A blank section of more than 9 seconds
- End of the tape or end ID
- Skip ID with SKIP PLAY activated

Number of times to be repeated
The selection to be repeated will be played back 5 times, and then the tape will stop

Playing all selections repeatedly

During playback, press the REPEAT 1/ALL button until the REPEAT ALL indicator appears on the display.
After the tape is played back to the end, it is rewound to the beginning and the playback of all selections is repeated In the RMS play (page 39), all the selections programmed are played back repeatedly.

To stop playing all selections repeatedly
Press the ⏏ OPEN/CLOSE button to eject the cassete

Note on the end of the repeated portion during the REPEAT ALL play
The tape is rewound to the beginning of the tape when the following is detected
- End of the tape or end ID
- A blank section of more than 9 seconds

Automatic Music Sensor Operation

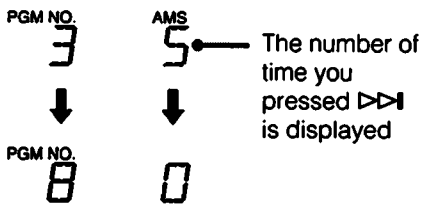
When you press the ⏮ or ⏭ button during playback, playback will start from the beginning of the desired selection.

When it is pressed in the pause mode, the deck enters the pause mode at the beginning of the designated selection. Press the ⏸ PAUSE or ▶ button to resume playback. For this operation, the start ID codes must be written on the tape.

For how to write the start ID, see page 28.

To locate the selection ahead
Press the ⏭ button. Each pressing advances the tape to the next selection in sequence.

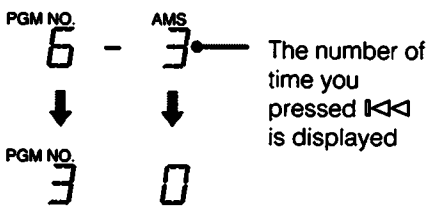
Example: To designate five selections ahead, press the ⏭ button five times.



When the designated selection is located, playback resumes.

To locate the previous selection
Press the ⏮ button. Each pressing moves the tape to the previous selection in sequence.

Example: To designate three selection back (excluding the selection being played), press the ⏮ button four times.

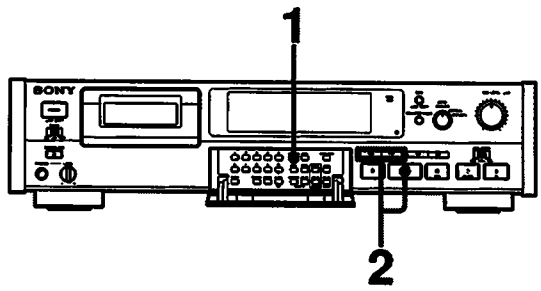


When the designated selection is located, playback resumes. The display returns to the counter display.

When designating the selection being played back, "– 0" appears.

You can designate a selection by pressing the numeric buttons, instead of pressing the ⏮ or ⏭ button several times. In this case, press the ⏮ or ⏭ button after pressing the numeric buttons.

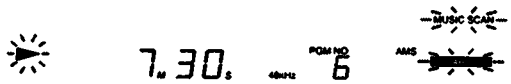
Music Scan



For this operation, the start ID codes must be written on the tape. For how to write the start ID codes, see page 28.

1 **During the stop mode, press the MUSIC SCAN button.**
The MUSIC SCAN indicator flashes and the designated scan time is indicated at the MARGIN display.

2 **Press the ▶ (play) button.**
The tape is rewound to the beginning, the first part of each selection (start ID position) is played back for the time you designated sequentially.
The ▶ and START ID indicators light during playback.



When you press the ⏭ button instead of the ▶ (play) button
The nearest start ID after the current position is detected, and, after playing back the first part of that selection for the time you designated, the next start ID in the forward direction is located.
This operation continues until the end of the tape.
When you press the ⏮ button instead of the ▶ (play) button
The nearest start ID before the current position is detected, and, after playing back the first part of that selection for the time you designated, the next start ID in the reverse direction is located.
This operation continues until the top of the tape.

Note
In case of tapes with a start ID too near the end of the tape, scanning from the end of a tape towards the beginning may not be possible. If the start ID is unnecessary, erase it (see page 29) and attempt the music scan again.

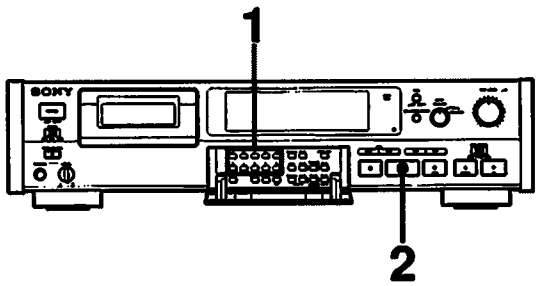
To designate the desired scan time
While the scan time is indicated at the MARGIN display in step 1, press the ◀◀ or ▶▶ button. You can designate the scan time up to 15 seconds in steps of a second. The scan time is 8 seconds if the scan time is not desingated. (The designated time remains memorized even if you turn off the unit.)

To listen to the beginning of a selection for more than the designated time
Press the ► (play) button while the selection you want to listen to is played back.
While pressing the ► button, the countdown at the MARGIN display stops, and the playback of that selection continues.

To listen to an entire selection
Press the MUSIC SCAN button while the selection you want to listen to is played back.
The music scan function is released, and the playback of that selection continues.

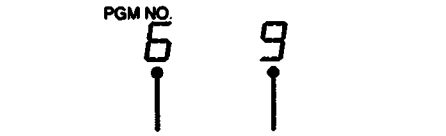
When you press the MUSIC SCAN button during playback, the tape is rewound to the beginning, and then the first part of each selection (start ID position) is played back for the time you designated sequentially.

Designating the Desired Selection



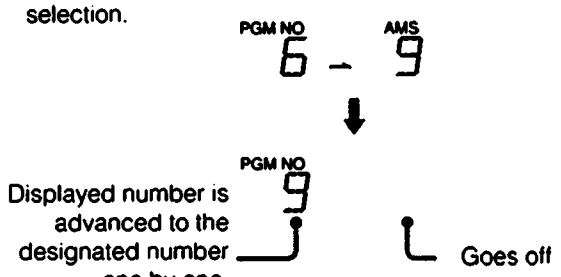
For this operation, the selections must be numbered by the program numbers. The program numbers are written at the same position as the start ID codes. For how to write the program number, see page 30.

1 During the desired program number with the numeric button(s)*.



Current program number — Designated program number

2 Press ► (play).
The designated selection is searched for at high speed and playback starts from the beginning of that selection.



* When you press the numeric button(s) during play-pause mode, the deck enters the pause mode at the beginning of the designated selection. Press the ❚❚ PAUSE or ► button to resume playback.

If an incorrect number is designated
Before pressing the ► button, press the CLEAR button
The displayed program number will be cleared.
Then designate the correct program number
Once the ► button is pressed, it is impossible to cancel the designated selection.

Skip Play

For this operation, the skip ID code(s) must be written on the tape.

Press the SKIP PLAY button.
The SKIP PLAY indicator lights.
During playback, the tape skips to the next start ID position automatically when a skip ID is detected, and the playback resumes.

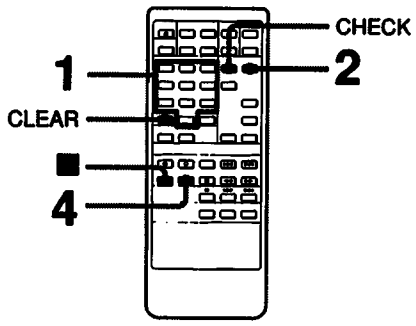
Note
The skip play function operates only when a start ID exists after the skip ID. If not, the unit will fast forward to the end of the tape at 16 times the normal speed, then stop

To stop skip play
Press the ⏏ OPEN/CLOSE button to eject the cassette

Auto Play: Restarting Playback After Rewinding

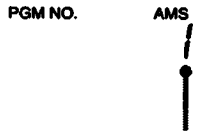
While pressing ◄◄, press ►
The tape is rewound to the beginning, and playback starts automatically.

Random Music Sensor (RMS*) Operation



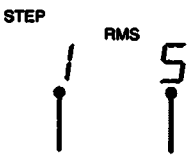
* RMS = Random Music Sensor
The RMS function allows you to program the desired selections in the desired order.
For the operation, program numbers must be written on the tape.
This operation can be performed only with the remote commander.

1 **Designate the desired selection by pressing the numeric button(s) during the stop mode.**
The selection numbers can be specified from 1 to 99.



Lights

2 **Press the ENTER button.**



Indicates the playing order.

The RMS indicator lights after programming the first selection.

3 **Repeat step 1 and 2.**
A maximum of 60 selections can be programmed.

4 **Press the ► (play) button.**
The programmed selections are played back in the designated order.

To stop RMS play
Press the ■ button.

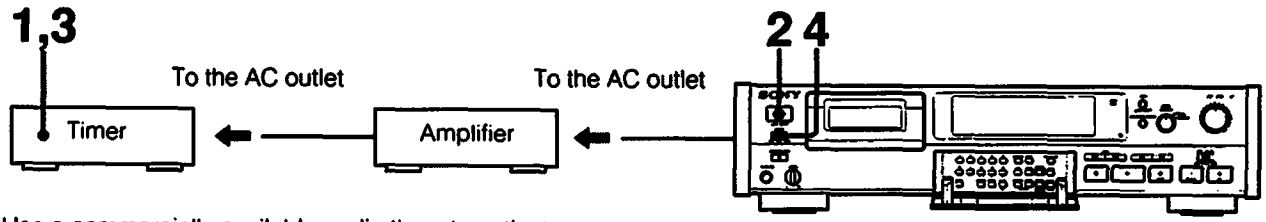
To check the programmed selections
Press the CHECK button on the remote commander. Each time you press the CHECK button, the programmed selections appear in the designated order.

To add a selection to the program
Once the RMS play starts, you cannot add a selection. To add a selection, first stop the RMS play, and program new selection(s) by following the procedure described on the left column.

To delete the selection you programmed last
Press the CLEAR button.
However, when checking the programmed selection, the CLEAR button cannot be used.

To cancel the entire program
In the stop mode: Press the ■ button once.
In the RMS play mode: Press the ■ button twice.

Timer Activated Operation



Use a commercially available audio timer to activate recording or playback at a desired time.
Read the operating instructions for the timer and the amplifier.

Timer Activated Recording

1 **Turn on the timer.**

2 **Turn on the DAT deck, and prepare for recording. (Follow steps of "Recording" on page 21.)**

3 **Set the timer to the desired time.**
Power to the amplifier and to the DAT deck is turned off. Leave the power switches of the equipment turned on.

4 **Set TIMER to REC.**
At the preset time, the power is supplied and recording starts after about 4 seconds.
The AUTO indicator will be the same as the one before the power of the DAT deck is turned off.
When the AUTO indicator lights, start IDs will be written during recording.

When timer activated recording is finished
Be sure to set the TIMER switch to the OFF position.

Precautions
- If the TIMER switch is left at the REC position, recording will start when the power is turned on the next time, and the tape contents will be erased.
- In timer recording (the TIMER switch is set to the REC position), the auto rewind function will not be activated even if the tape is fully taken up. The tape stops without being rewound so that recording will not be performed over the previously recorded material.
- Be sure to activate timer recording with the cassette inserted properly in the cassette compartment.

Timer Activated Playback

1 **Turn on the timer.**

2 **Turn on the DAT deck, and insert the cassette.**

3 **Set the timer to the desired time.**
Power to the amplifier and to the DAT deck is turned off. Leave the power switches of the equipment turned on.

4 **Set the TIMER switch to the PLAY position.**
At the preset time, the power is supplied and playback starts after about 4 seconds

When timer activated playback is finished
Normally set the TIMER switch to the OFF position
If you want to start playback at the preset time every day automatically, leave the TIMER switch to the PLAY position

Note
The built-in clock can be used only for the date function To record and playback at a desired time, use a commercially available timer.

Maintenance

Cleaning the Cabinet

Clean the cabinet, panels and controls with a soft cloth slightly moistened with a mild detergent solution. Do not use any type of abrasive and, scouring powder or solvent such as alcohol or benzine.

Cleaning the Head

Prolonged operation will cause contamination of the head. To obtain the best possible recording and playback sound, we recommend that you use the Sony DT-10CL cleaning cassette (not supplied) to clean the head after every ten hours or so of operation.
Clean the head with the cleaning cassette when the unit will not be used for a long period of time. Contamination of the head may cause sound drop-out during playback.

How to use the cleaning cassette

1 **Insert the cleaning cassette as you would a normal DAT cassette.**

2 **Press ► . After about 10 seconds, press ■ .**

3 **Remove the cleaning cassette without rewinding it, then proceed with recording and playback with a normal DAT cassette and check the sound quality.**

Notes on the cleaning cassette

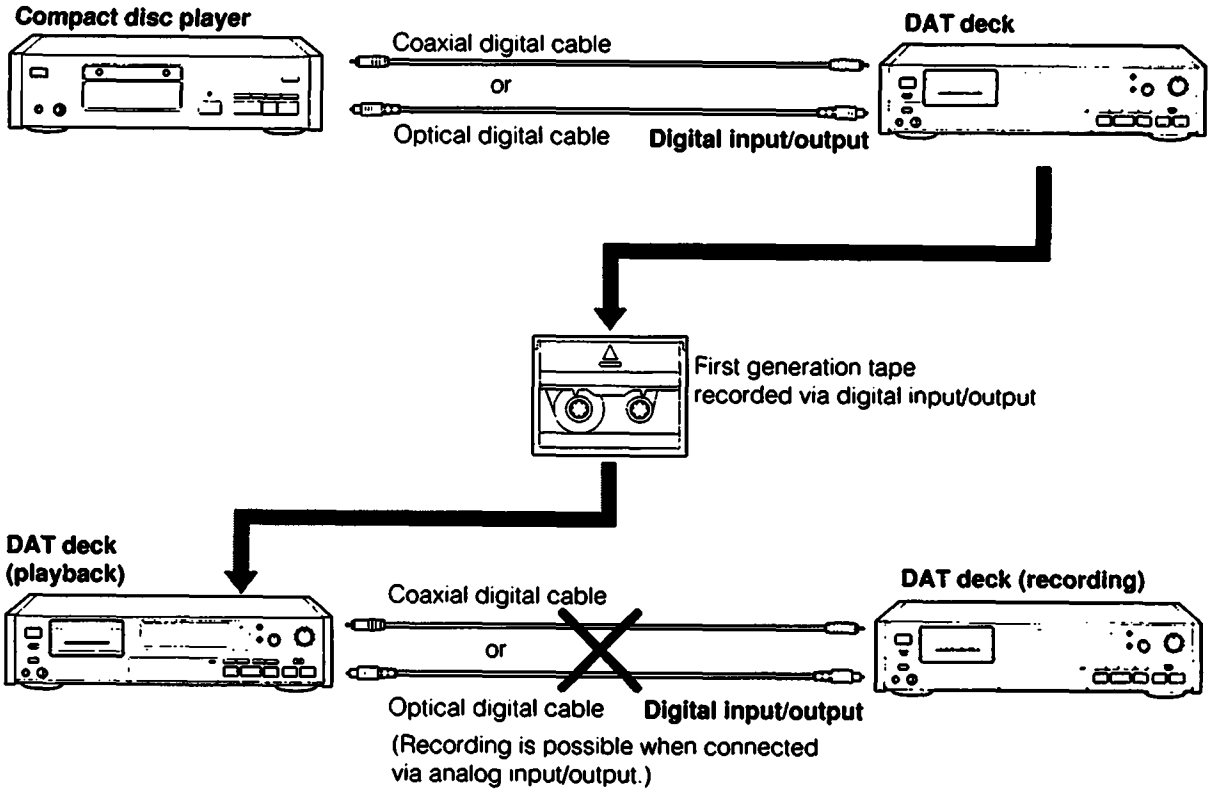
- The cleaning cassette cannot be used for recording and playback.
- Do not repeat the cleaning procedure more than 5 consecutive times. Excessive cleaning of the head may cause wear to the head.
- Do not rewind the cleaning cassette after each use. Rewind the cleaning cassette tape only when it reaches the end.
- The cleaning cassette can be used for up to 200 ten-second cleaning sessions.
- Due to the shortness of the cleaning cassette, the linear counter will not show the actual running time and remaining time of the cassette.

Guide to the Serial Copy Management System

This digital audio tape deck adopts the Serial Copy Management System. This system enables one generation of digital recording of prerecorded software via digital input/output. A summary of this system is as follows:

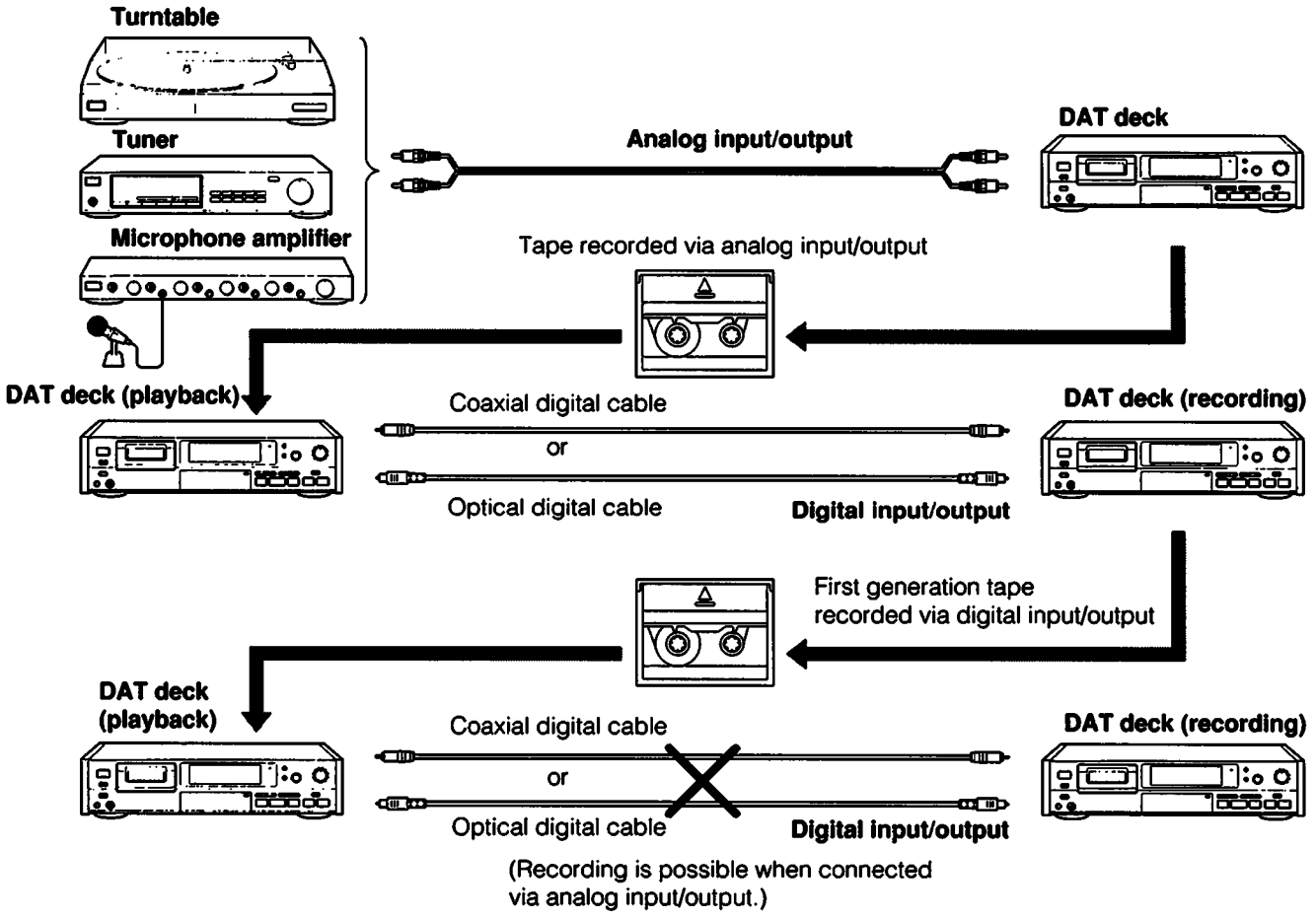
1

You can record a compact disc to a digital audio tape via digital input/output. But you cannot record the recorded tape to another via digital input/output.



2

You can record a digital audio tape recorded via analog input/output to another via digital input/output. But, you cannot make a second generation tape via digital input/output.



Remarks

There are no restrictions for generation when DAT decks are connected via analog input/output each other.
These rules does not apply when you use a DAT deck which does not adopt the Serial Copy Management System.

Troubleshooting

	Symptom	Cause	Remedy
Basic operation	**The tape is ejected after being loaded.**	The cassette is inserted incorrectly.	Insert the cassette correctly (page 19)
	The tape does not move.	For 4 seconds after the power is turned on, the buttons do not function.	Wait until the blinking of the ▮▮ indicator goes off and then try again.
		The ▮▮ PAUSE button is activated. (The ▮▮ indicator lights.)	Press the ▮▮ PAUSE button to release pause.
		The tape is wound completely.	Press the ◀◀ or I◁◁ button to rewind
	The sound is not heard.	Incorrect connections.	Connect properly (pages 15 and 16)
		Incorrect operation of the connected amplifier.	Operate the amplifier as required by the deck operation (Refer to the operating instructions of the amplifier.)
	Recording cannot be made.	The safety tab of the cassette is open.	Close the tab of the cassette (page 19)
		Incorrect position of the INPUT selector.	Set the INPUT selector correctly Set it to the DIGITAL position to record sound from the equipment connected to the COAXIAL IN or OPTICAL IN jacks Set it to the ANALOG position to record sound from the equipment connected to the LINE IN jacks.
		The digital copy prohibit signal exists in the source signal input to the digital input jack.	Connect the source equipment to the LINE IN jacks
	The sound is not heard from the recorded tape.	When recording analog input signals, the recording level is turned down completely. (When recording the analog input signal.)	Adjust the recording level by using the REC LEVEL controls (page 23)
	The CAUTION indicator lights, and no button does function.	Moisture condenses inside the unit.	Leave the unit turned on for about an hour (page 4).
		Defective or damaged cassette is inserted.	Remove the cassette.
		The cassette is removed forcibly from the cassette compartment.	Turn off the unit and then turn on again
	The SBM indication does not light up during recording.	The SBM function operates only during analog recording (44.1 kHz, 48 kHz).	Set the INPUT selector to ANALOG, the REC MODE selector to a position other than LONG, then start recording

	Symptom	Cause	Remedy
Sub code operation	**Start ID cannot be written during recording.**	A new start ID cannot be written within 9 seconds (18 seconds in the long-play mode) from the end of another start ID.	Leave at least 9 seconds (18 seconds in the long-play mode) from the end of another start ID.
	Search function does not operate during playback.	The start ID is not written correctly.	Erase it (page 29), and then write it again.
		The portion between the end of a start ID and the beginning of the following start ID is less than 9 seconds (18 seconds in the long-play mode) long.	When writing the start IDs manually, write so that the intervals between them are more than 9 seconds (18 seconds in the long-play mode).
		The selected program number does not exist on the tape.	Use the RENUMBER button to re-arrange the program numbers (page 31).
		The program numbers are out of order.	
	Search function operates suddenly during playback.	The skip play function is operating. (The SKIP PLAY indicator lights in the display window.)	Turn off the indicator by pressing SKIP PLAY.
		The repeat play function is operating.	Turn off the indicator by pressing REPEAT 1/ALL.
	Search function stops.	There is a blank section between selections. (The sampling frequency indicator blinks on the display window.)	Use the end search function (page 24) when recording so that no blank is created.
	The tape operation buttons do not operate while writing the start ID.	While writing the start ID (9 seconds or 18 seconds), none of the buttons except the ■ button are operative.	Operate after the start ID is written.
	The absolute time codes cannot be written.	Recording was started from the blank section.	Rewind the tape to the beginning, or locate the very last point of the previous recording, using the end search function (page 24), and start recording from the point.
	End ID cannot be written during playback.	The portion where you want to write the end ID is blank.	Set the deck in the record-pause mode by pressing ● REC, then write the end ID.
	Renumbering function does not operate.	• The portion between the end of a start ID and the beginning of the following start ID is less than 9 seconds (18 seconds in the long-play mode) long. • The start ID is written near the end of the tape.	• When writing the start IDs manually, write so that the intervals between them are more than 9 seconds (18 seconds in the long-play mode). • Erase the start ID near the end of the tape.
	Start ID cannot be erased.	The portion between the end of a start ID and the beginning of the following start ID is less than 9 seconds (18 seconds in the long-play mode) long.	When writing the start IDs manually, write so that the intervals between them are more than 9 seconds (18 seconds in the long-play mode).
	Skip ID cannot be erased.	Two skip IDs are written continuously.	When writing the skip IDs, write so that the intervals between them are more than 1 second (2 seconds in the long-play mode).
	End ID cannot be erased.	The end ID is written at the beginning of the tape.	Start recording from the beginning of the tape.
		The end ID is written immediately after a start ID.	First erase the start ID.

Troubleshooting

	Symptom	Cause	Remedy
Others	**Tape transport noise seems excessively loud in rewind or fastforward mode.**	This situation depends upon the cassette being used and is not a problem.	—
	The tape stops running suddenly.	A defective or damaged cassette has been inserted.	Press the ⏏ OPEN/CLOSE button to change the tape
	Unbalanced left and right volume.	Incorrect adjustment of the recording balance.	Adjust the recording balance correctly by using the REC LEVEL controls (page 23).
	Increase of noise or deterioration of sound quality.	Contamination of the head.	Clean the head, using the cleaning tape
	The clock for the date function does not operate once the power is off.	The battery built in this unit is weak.	Ask the Sony dealer to change the battery.
	After pressing ◀◀ / ▶▶ or I◁◁ / ▷▷I , the tape stops for a moment, and then starts running.	This is not a problem.	—

Specifications

Tape	Digital audio tape
Recording head	Rotary head
Recording time	Standard: 120 minutes. Long-play mode: 240 minutes (with DT-120)
Tape speed	Standard: 8.15 mm/s, Long play mode: 4.075 mm/s
Drum rotation	Standard: 2,000 rpm, Long-play mode: 1,000 rpm
Error correction	Double Read Solomon code

Tape

Track pitch	13.6 µm (20.4 µm)
Sampling frequency	48 kHz, 44.1 kHz, 32 kHz
Modulation system	8 -10 Modulation
Transfer rate	2.46 Mbit/sec.
Number of channel	2 channels, stereo
D/A conversion (Quantization)	
	Standard: 16-bit linear
	Long-play mode: 12-bit non-linear
Frequency response	Standard: 2 - 22,000 Hz (±0.5 dB)
	Long-play mode: 2 - 14,500 Hz (±0.5 dB)
Signal to noise ratio	Standard: more than 92 dB
	Long-play mode: more than 92 dB
Dynamic range	Standard: more than 92 dB
	Long-play mode: more than 92 dB
Total harmonic distortion	Standard: less than 0.0045 % (1 kHz)
	Long-play mode: less than 0.08 % (1 kHz)
Wow and flutter	Below measurable limit (±0.001 % W. PEAK)

Input

	Jack type	Impedance	Rated input level
LINE IN	phono jack	47 kohms	–4 dBs
DIGITAL IN	phono jack	75 ohms	0.5 Vp-p, ±20 %
DIGITAL IN	optical jack	—	—

Output

	Jack type	Impedance	Rated output	Load impedance
LINE OUT	phono jack	470 ohms	–4 dBs	More than 10 kohms
PHONES	stereo phone jack	220 ohms	0.6 mW	32 ohms
DIGITAL OUT	phono jack	75 ohms	0.5 Vp-p ±20 %	—

DIGITAL OUT (optical jack): wavelength 660 nm

General

Power requirements	120 V AC, 60 Hz
Power consumption	33 W
Dimensions	U.S.A. model: Approx. 430 × 110 × 350 mm (w/h/d) (17 × 4 3/8 × 13 7/8 inches)
	Canadian model: Approx. 470 × 110 × 350 mm (w/h/d) (18 5/8 × 4 3/8 × 13 7/8 inches)
Mass	U.S.A. model: Approx. 6.0 kg (13 lb 4 oz) (w/h/d)
	Canadian model: Approx. 6.6 kg (14 lb 10 oz)

Remote commander (supplied)

Remote control system	Infrared control
Power requirements	3V DC, with two size AA (R6) batteries
Dimensions	Approx. 63 × 19 × 175 mm (w/h/d) (2 1/2 × 3/4 × 7 inches)
Mass	Approx. 130 g (4 oz) incl. batteries.

Supplied accessories

Sony batteries SUM-3(NS) (2)
Audio connecting cords (2 phono plugs - 2 phono plugs, stereo for line inputs and outputs) (2)
Screws (4) (only on the Canadian model)

Design and specifications are subject to change without notice.

Accessories not supplied

Optical cable	POC-15SP, etc.
Connecting cord	RK-C510HG, etc. (2 phono plugs - 2 phono plugs: connectors plated with gold, high quality litz line cord)
	VMC-10HG, etc. (phono plug - phono plug): for digital connection
Cleaning cassette	DT-10CL